

Investing in Indonesia's Education:

Allocation, Equity, and Efficiency of Public Expenditures

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Abstract

What are the current trends and main characteristics of public education spending in Indonesia? Is education spending insufficient? Are expenditures in education efficient and equitable? This study reports the first account of Indonesia's aggregated (national and sub-national) spending on education, as well as the economic composition of education spending and its breakdown by programs. It presents estimations of the expected (average) level of education spending for a country with its economic and social characteristics. This analysis sheds light on the efficiency and equity of education spending by presenting social rates of return by level of education, by assessing the adequacy of current teacher earnings relative to other paid workers and the distribution of

teachers across urban, rural, and remote regions, and by identifying the main determinants of education enrollment. It concludes that the current challenges in Indonesia are no longer defined by the need of additional spending, but rather the need to improve the quality of education services, and to improve the efficiency of education expenditures by re-allocating teachers to undersupplied regions and re-adjusting the spending mix within and between education programs for future additional spending in the sector. The study finds that poverty and student-aged labor are also significant constraints to education enrollment, stressing the importance of policies aimed at addressing demand-side factors.

This paper—a joint product of the Poverty Reduction and Economic Management (PREM) and the Human Development Units of the Country Office Indonesia, East Asia and Pacific Region—is part of a larger effort to support expenditure analysis on the education sector in Indonesia. Policy Research Working Papers are also posted on the Web at <http://econ.worldbank.org>. The authors may be contacted at farzedelgranado@worldbank.org, wfengler@worldbank.org, aragatz@worldbank.org, and eyavuz@worldbank.org.

The Policy Research Working Paper Series disseminates the findings of work in progress to encourage the exchange of ideas about development issues. An objective of the series is to get the findings out quickly, even if the presentations are less than fully polished. The papers carry the names of the authors and should be cited accordingly. The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors. They do not necessarily represent the views of the International Bank for Reconstruction and Development/World Bank and its affiliated organizations, or those of the Executive Directors of the World Bank or the governments they represent.

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1. Introduction

In academic year 2004/2005, public and private schools at all levels of education enrolled 50.6 million pupils in over 270,000 schools. Based on Law 20, 2003, formal education in Indonesia begins with kindergarten comprised of 2 years followed by primary school which is made up of the first 6 grades. Graduates from primary school continue with secondary education, which is divided into junior and senior secondary levels, comprised of 3 grades each. Graduates from senior secondary schools can continue to diploma or graduate programs or to other types of higher education including university (with numbers years to completion varying depending on the program). In the academic year 2004/2005 the distribution of students across these levels of education was: 5 percent kindergarten, 59 percent pre-school and primary education, 17 percent junior secondary education, 13 percent senior secondary, and 6 percent higher education.

Indonesia has a target of reaching 100 percent gross enrollment rates at the primary school level and 96 percent at the junior secondary school level by 2009. Law Number 20 of 2003 of the National Education System proclaims that every citizen aged 7–15 years must attend basic education. This law implies that the government should provide free educational services to all pupils at the basic level of schooling. Achieving these enrollment targets in education, coupled with investments improving the quality of education, is essential to sustain Indonesia's growth and competitiveness in the region for the years to come. Efficient and effective education spending will thus be a central element in Indonesia's poverty reduction strategy.

Since the 1970s, enrollment rates have increased significantly as a result of the government's sustained drive to build schools across the country. The results have been impressive: the net primary school enrollment rate has increased from 72 percent in 1975 to nearly universal coverage by 1995 and stayed high even through the financial crisis of the late 1990s. In 2005 the net primary enrollment rate was 91 percent (and the gross enrollment rate even exceeded 100 percent).¹ The net enrollment rate for junior secondary education showed an even more marked increase, rising from 18 percent in the 1970s to approximately 62 percent in 2005 (with a gross enrollment rate of 82 percent). The senior secondary enrollment rate has also been increasing, although at a more modest rate (Table 1).

Table 1 Gross and Net Enrollment Rates for Different Levels of Education in Indonesia 1995–2004

| | 1970 | 1980 | 1995 | 1998 | 2000 | 2002 | 2004 | 2005 |
|------------------------------|--------|------|-------|-------|-------|-------|-------|-------|
| Net enrollment rate | | | | | | | | |
| Primary level | 72 (a) | 88 | 91.5 | 92.3 | 92.4 | 92.7 | 93.0 | 90.9 |
| Junior secondary level | 17 (a) | -- | 51.0 | 58.4 | 61.7 | 60.9 | 65.2 | 62.1 |
| Senior secondary level | 17 (a) | -- | 32.6 | 36.9 | 39.5 | 36.8 | 42.9 | 41.6 |
| Gross enrollment rate | | | | | | | | |
| Primary level | 80 | 107 | 107.0 | 109.3 | 110.1 | 106.1 | 107.0 | 104.9 |
| Junior secondary level | 16 | 29 | 65.7 | 70.3 | 76.0 | 79.5 | 82.2 | 80.5 |
| Senior secondary level | 16 | -- | 42.4 | 46.4 | 51.5 | 50.4 | 54.4 | 52.6 |

Source: WB Education Sector Review 2005; various years of Susenas; (a) data points correspond to the year 1975.

However, education services still are not at the desired levels. Critical challenges remain to achieve the goals of the Education for All (EFA), particularly increasing enrollment in junior

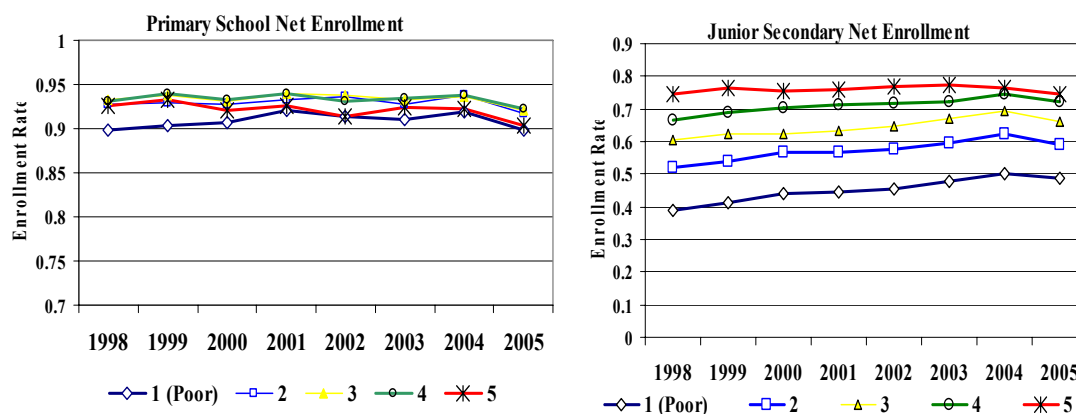
¹ The gross enrollment ratio in education is the total enrollment at that education level, regardless of age, as a percentage of the official school age population for that level. The ideal ratio is a 100 percent, but ratios greater than 100 can occur when there are high numbers of students in a level that does not officially correspond with the education level's age group. A high (greater than 100) gross enrollment ratio can be indicative of inefficiencies in the educational system. The net enrollment ratio provides the number of students that are of the required age group and are enrolled in school divided by the total number of students in that age group.

secondary schools, targeting the poor and improving the quality of teaching.² The following sections provide an in-depth analysis of these challenges.

Reducing Inequality in Enrollment Levels

Indonesia's past enrollment expansion closed the gap across income groups at the primary education level, but striking inequalities remain at the junior and senior secondary levels. In 2005 the primary school (SD) enrollment rates were 105 percent gross and 91 percent net. Problems with access become more significant at the junior secondary school level, where there is a considerable discrepancy in enrollments among income quintiles (Figure 1). A child coming from a poor family is 20 percent less likely to be enrolled in a junior high than a non-poor child.³ Officially, basic education (grades 1–9) is compulsory for children aged 7–15, but the main issue in terms of access to education concerns the transition to junior secondary schooling.⁴

Figure 1 Enrollment Rates by Income Groups - Primary and Junior Secondary Education



Source: World Bank staff calculations with Susenas 2005 core data.

Despite an impressive increase in enrollment at the national level, regional differences remain significant. In a country as large, spread out, and diverse as Indonesia, differences among regions are to be expected. Although more than 90 percent of Indonesia's children have access to primary schools, some regions have been lagging for sustained periods and thus need extra assistance. In 2004 net enrollment rates in primary education ranged from approximately 80 percent in the province of Papua to about 95 percent in Kalimantan Tengah. At the junior secondary level, net enrollment rates varied from about 41 percent in Papua to approximately 77 percent in D.I. Yogyakarta, and at the senior secondary level, from around 20 percent in Sulawesi Barat to approximately 62 percent in D.I. Yogyakarta. However, the disparities are even greater within provinces than between provinces.

Improving Quality of Education

The quality of schooling in Indonesia is low and education infrastructure is deteriorating. Some important determinants of education quality that need to be addressed include the level of teacher qualification, the structure of teacher compensation, class-room quality, teacher attendance rates,

² Indonesia's Education For All goals are: (i) enrolling all students through to the end of junior secondary level, (ii) ensuring that poorer and disadvantaged children have full and equal access to schools that provide an appealing learning environment and effective instruction, and (iii) providing education that is of acceptable quality and is relevant to Indonesia's economy and society.

³ World Bank, Poverty Assessment (2006)

⁴ Tertiary education is not part of the scope of this paper. Total gross enrollment rates at the tertiary education level are very low, a mere 16 percent. The poorest quintile has a negligible enrollment of 1 percent, whereas the richest quintile's enrollment is close to 50 percent.

and class size. There is a clear need for teacher educational attainment to be improved in Indonesia. For primary and junior secondary levels, only about 55 and about 73 percent of the teachers have the minimum qualifications required by the Ministry of National Education (MoNE).⁵ The GoI is tackling the problem with its recent law on teacher certification (December 2005) by providing a new form of incentives for all teachers to obtain certifications. These additional incentives will significantly increase teacher base salaries. The increases could translate into higher learning achievement if adequate mechanisms and institutions of performance control (i.e. teacher attendance and teaching quality) are implemented. Furthermore, strong accountability is a required precondition for effective performance control. Effective accountability mechanisms in other countries have combined top-down accountability (from schools to districts-provinces) with bottom-up accountability (from schools to constituents and parent committees).⁶ Deteriorating classroom quality is another serious problem for the Indonesian education system, particularly at the primary level, where only 44 percent of classrooms satisfy the minimum standards set by MoNE.⁷ In the past, the government's education strategy has favored access at the expense of quality. Finally, although the student-teacher ratio is low, the fact that there are large numbers of part-time and absent teachers still leads to a high student-class ratio.

Moreover, the Indonesian education system does not produce enough students with the knowledge and skills required to work in economic sectors with high growth potential. Indonesian newspapers report frequently on the gap between what schools offer, and the needs of civil society for an engaged electorate, as well as the demands of the enterprise sector for employees and entrepreneurs with imagination and problem-solving skills. The results of the 2002 examinations show that out of a possible 10 points for each subject area, the more than 2.2 million students from nearly 20,000 schools who took the tests averaged scores of 5.79 for math, 5.11 for Bahasa Indonesia, and 5.29 for English. Figures for 2005/2006 indicate a significant increase in scores, now averaging 7.13 for math, 7.46 for Bahasa, and 6.62 for English.⁸ The reliability of the test results is debatable however, and comparing test-scores across years is only valid if the test-designs do not change substantially.

2. Public Expenditures in Education

General trends

Since the mid-1990s, Indonesia has built an upward trend in real government expenditures on the education sector.⁹ The only two exceptions were a temporary decrease during the crisis and a slight dip in 2004. The decrease in spending in 2004 was jointly caused by low budget execution and a crowding-out effect in most social sectors due to increasing fuel subsidies. The relative size of education expenditures is expected to peak in 2007, with approximately 17.2 percent of overall national expenditures (Table 2).¹⁰ After the slight negative real growth in 2004, education

⁵ Ministry of National Education, Indonesia: Educational Statistics in Brief 2004/2005.

⁶ A widely praised example of community participation bottom-up accountability is that of the EDUCO in El Salvador.

⁷ Ministry of National Education, Indonesia: Educational Statistics in Brief 2004/2005.

⁸ Ministry of National Education, Data from the Assessment Center.

⁹ In this chapter education spending for central government is defined following the sectoral budget classification. And from Sector 11: Education, National Culture, Belief in God Almighty, Youth and Sports Sector, the sub-sectors 11.1 Education, and 11.2 Official and Informal Education sub-sector are included in the analysis, which together account for 98 percent of the sector total.

¹⁰ In 2004, total national spending increased by approximately 4 percent; however, the share of education expenditures decreased to approximately 14 percent. Education expenditures as a share of GDP also decreased in 2004 relative to 2003—from about 3.2 percent to about 2.8 percent—as did the ratio of overall national expenditures to GDP—from 19.9 percent to 19.6 percent.

expenditures increased again by 8.4 percent in 2005, followed by a dramatic 41.6 percentage increase in 2006.

Table 2 National Public Expenditure on Education (Central + Province + District) for 2001-2007
Rp trillion

| | 2001 | 2002 | 2003 | 2004 | 2005 | 2006* | 2007** |
|---|-------|-------|-------|-------|-------|-------|--------|
| Nominal national education expenditures | 40.5 | 48.2 | 64.8 | 61.8 | 74.0 | 118.2 | 135.4 |
| National education expenditures (2001 prices) | 40.5 | 43.1 | 54.3 | 48.8 | 52.9 | 74.9 | 80.7 |
| Growth real national education expenditures (%) | 40.3 | 6.4 | 26.2 | -10.2 | 8.4 | 41.6 | 7.8 |
| Education exp. (% total of national exp.) | 11.4 | 14.3 | 16.0 | 14.0 | 13.9 | 16.9 | 17.2 |
| National education exp. (% of GDP) | 2.4 | 2.6 | 3.2 | 2.7 | 2.7 | 3.8 | 3.8 |
| Total nominal national expenditures | 353.6 | 337.6 | 405.4 | 441.8 | 531.7 | 698.2 | 785.4 |
| Total real national expenditures (2001 prices) | 353.6 | 301.8 | 340.0 | 348.9 | 380.0 | 442.4 | 468.3 |
| Government size (total exp. as % of GDP) | 21.0 | 18.1 | 19.8 | 19.4 | 19.5 | 22.4 | 22.2 |

Source: World Bank staff calculations base on MoF and SIKD data.

Note: * = preliminary realization of APBN and estimates for sub-national spending, ** = central government budget (APBN) and estimates for sub-national governments.

Due the recent increase in spending, Indonesian education expenditures rank almost on par with many other developing countries with a similar per capita income. It can be argued that nations with a larger government size (total public expenditures as percentage of GDP) tend to spend more on social sectors in absolute, but also in relative terms. This line of argument could justify, for example, why Indonesia's education expenditures are lower than those in Malaysia, which has a significantly larger overall size of government (Table 3). However, Indonesia spends a significantly lower percentage of GDP on education relative to Thailand, which has a smaller government size. This low share of spending applies to almost all sectors in Indonesia because of the relatively small share of the government sector itself and also because of the large amount of current spending, particularly for subsidies.

Table 3 Education Public Expenditure in Indonesia's Neighboring Countries

| | Highest | | Lowest | |
|---|-----------|-------------|-------------|-------------|
| Education public expenditure % of total expenditure | Malaysia | Thailand | Indonesia | Philippines |
| | 27.0 | 27.0 | 16.9 | 16.0 |
| Education public expenditure % of GDP | Malaysia | Thailand | Indonesia | Philippines |
| | 8.1 | 4.6 | 3.8 | 3.1 |
| Total public expenditure % of GDP (size of government sector) | Malaysia | Indonesia | Philippines | Thailand |
| | 29.7 | 22.4 | 19.6 | 16.8 |
| GDP per capita (constant 2000 US\$) | Malaysia | Thailand | Philippines | Indonesia |
| | 4,290 | 2,356 | 1,085 | 906 |
| Population (million) | Indonesia | Philippines | Thailand | Malaysia |
| | 217.6 | 81.6 | 63.7 | 24.4 |
| Percent population aged 0-14 | Thailand | Indonesia | Malaysia | Philippines |
| | 4.1 | 3.5 | 3.0 | 2.8 |

Source: Data for Thailand, Malaysia, the Philippines are from the World Bank Development Indicators (latest year available); data for Indonesia are from the preliminary realization of central budget and estimates for sub-national spending for 2006 based on previous years (base data from Ministry of Finance).

Although it is common practice to make international comparisons of selected expenditure indicators, such as the one presented above, these figures often are not 'comparable' when other dimensions are taken into consideration. A variety of economic and demographic factors should be considered, however, when comparing education expenditures across countries. Factors that may bias a one-dimensional comparison include the size of the public sector, the size of the economy as a whole, the national income level, the level of government revenues, the public-private participation shares, the number of service beneficiaries, the prices of key inputs. Among many other studies, Verbina and Chowdhury (2002), Fernandez and Regerson (2001), Arze et al (2005), discuss the determinants of public education spending. Results from an estimation that controls for several determinants of education expenditure allocations, including population, population density, GDP per capita, the level of fiscal decentralization, and budget balance; Indonesia's level of education spending could be expected to be around 17 percent of its overall

budget. The estimated marginal effects of the determinant factors across countries can be estimated and used to predict roughly the level that a country with a specific set of economic and demographic characteristics would be likely to spend on education. The prediction reported above is based on panel data from developing and industrialized countries over the period 1976-2000. Expenditure data is drawn from the IMF's Government Financial Statistics. Unfortunately this exercise is rather data exhaustive and the latest year available for the whole series has typically a lag from three to four years.¹¹ What can be concluded, with some degree of confidence, is that that the level of education spending is not, by any means, significantly below what could be the optimal level relative to the overall national budget, especially taking into account further evidence suggesting that spending in other sectors such as infrastructure and health are below their optimal levels (World Bank, 2007).

Economic Composition by Level of Government

In 2005 the majority of education expenditures, approximately 62 percent, was executed at the sub-national level. District governments are the main spenders, accounting for 57 percent of total spending; with provinces accounting for 6 percent. These shares of total education expenditures have been somehow stable since 2001 (Table 4).

Table 4 Nominal Education Expenditures per Level of Government 2001–05
Rp. trillion

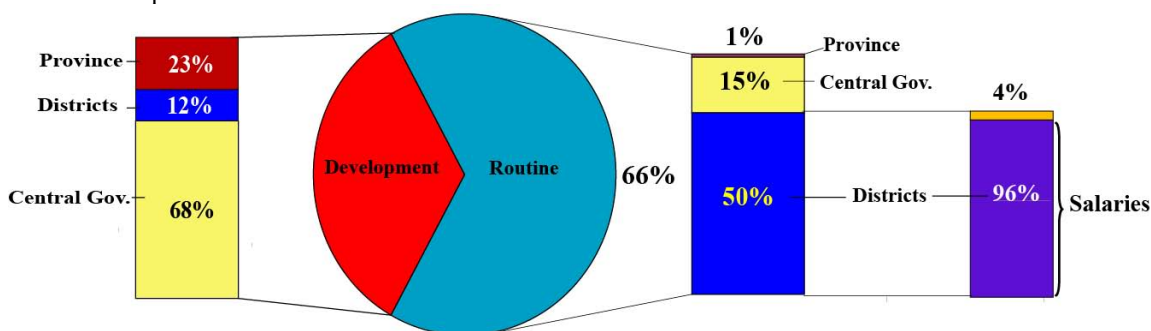
| | 2001 | % | 2002 | % | 2003 | % | 2004 | % | 2005* | % |
|---------------------------|-------------|------------|-------------|------------|-------------|------------|-------------|------------|-------------|------------|
| Central | 12.6 | 31 | 13.8 | 27 | 21.3 | 34 | 19.4 | 31 | 28.3 | 38 |
| Development | 8.5 | 67 | 9.2 | 67 | 16.0 | 75 | 12.3 | 63 | 17.1 | 60 |
| Routine | 4.1 | 33 | 4.6 | 33 | 5.4 | 25 | 7.1 | 37 | 11.3 | 40 |
| Provincial | 1.9 | 5 | 4.0 | 8 | 3.9 | 6 | 2.6 | 4.1 | 3.8 | 5 |
| Development | 1.4 | 70 | 2.6 | 66 | 3.1 | 80 | 1.8 | 69 | 2.9 | 77 |
| Routine | 0.6 | 30 | 1.4 | 34 | 0.8 | 20 | 0.8 | 31 | 0.9 | 23 |
| District | 26.2 | 64 | 32.6 | 65 | 38.3 | 60 | 39.8 | 64 | 41.8 | 57 |
| Development | 3.0 | 11 | 4.6 | 14 | 5.3 | 14 | 4.6 | 12 | 5.1 | 12 |
| Routine | 23.2 | 89 | 28.0 | 86 | 33.0 | 86 | 35.2 | 88 | 36.8 | 88 |
| Total Expenditures | 40.8 | 100 | 50.4 | 100 | 63.6 | 100 | 61.8 | 100 | 74.0 | 100 |

Source: Computed by World Bank staff based on data from MoF. *Note:* * Due to the reform in the budget system the 2005 central development spending figure reported here is an approximation of the old format equal to capital spending (Rp 2.0 trillion) plus social aid (Rp 15 trillion).

Even though district governments spend the majority of the total education budget, these expenditures are mostly nondiscretionary routine expenditures. Hence, while decentralization formally devolved the responsibilities for education from the central level to the sub-national level, the majority of the *development* expenditures (closer available to the definition of 'capital expenditures' before 2005) is still spent by the central government. Since 2001, the central government has been consistently covering more than 55 percent of total development spending, with districts only covering approximately a quarter. Furthermore, as it is discussed in further detail in section four, subnational governments do not have any discretion over their personnel administration either, due to the mechanism of allocation of the general allocation transfer (DAU). Hence, despite their apparently large participation in the sector, local governments have surprisingly little discretion in managing funds and shaping the key education sector decisions, with the adverse effects of weakening the accountability links of the decentralized system.

¹¹ See annex 2 for further details on the methodology employed for this estimation.

Figure 2 Education Spending by Economic Classification, Level of Government, and District Spending Routine Composition – 2005



Source: World Bank staff estimates based on data from MoNE

In terms of the composition of routine expenditures, the vast majority of routine expenditures at the sub-national level is used to cover the wage bill, followed by a significantly lower share for expenditures on goods and materials and others (Figure 2). In 2005, development expenditures accounted for 34 percent of national consolidated expenditures on education, whereas in 2004 they accounted for a little less, approximately 32 percent. A slight decrease in education spending in 2004, resulted predominantly from a decline in central development spending (Table 4). Routine expenditures on goods and materials on other routine spending at the sub-national level are significantly low relative to personnel spending (Table 5).

Table 5 Routine Expenditure Distribution by Level of Sub-National Government 2002–04
(Percentage of routine education expenditures)

| | District | | | | Province | | | |
|------------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Composition of Routine Expenditure | 2002 | 2003 | 2004 | 2005 | 2002 | 2003 | 2004 | 2005 |
| Personnel Expenditure | 94 | 95 | 96 | 95 | 69 | 62 | 71 | 72 |
| Goods Expenditure | 4 | 3 | 3 | 4 | 22 | 25 | 21 | 17 |
| O&M Expenditure | 0 | 0 | 0 | 0.6 | 6 | 9 | 5 | 8.3 |
| Travel Expenditure | 0 | 0 | 0 | 0.3 | 1 | 2 | 3 | 2.8 |
| Miscellaneous Expenditure | 2 | 1 | 0 | 0.0 | 2 | 3 | 0 | 0 |
| Total Routine Expenditure | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

Source: World Bank staff estimates based on data from MoF

Note: Development expenditures include non-formal and occupational education sub-sector for 2001–02. For 2003–04 reclassified from capital and operation and maintenance (O&M) expenditures. The percentage may not completely 100 percent due to the rounding.

Spending by Education Programs

In 2005 national spending on primary education accounted for 47 percent of total education spending; junior and senior secondary education accounted for 27 and 15 percent respectively, whereas tertiary education for 12 percent. Analyzing the functional classification of education spending, in 2005 the central government spent Rp. 25.1 trillion on education. The majority of central government expenditures on education, Rp. 19.7 trillion, or approximately 79 percent, was channeled through the Ministry of Education. The remaining Rp. 5.4 trillion was executed by the Ministry of Religious Affairs. Central government spending on primary education, Rp. 3.6 trillion, consisted mostly of development spending (~93 percent), while spending on tertiary education, Rp. 8.2 trillion, was composed mainly of routine expenditures (~73 percent).

Secondary education, particularly junior secondary, is a priority for Indonesia. In the context of rising education budgets, it would be desirable to allocate a larger share of the incremental budget to junior secondary schools. The Ministry of Education recognizes the need for increased spending at the secondary level, and states in its medium-term development plan (Renstra) the intention to increase the budget to 8.9 trillion by 2009. This would be to fund strategic programs including the theme of educational expansion and equity, as well as quality improvement and

relevance.¹² According to the decentralized system, sub-national governments are responsible for providing secondary education. While spending on junior education by districts is significantly lower than that of primary; higher central spending in junior education, partially, compensates for this.¹³ The largest share of central government routine expenditure was allocated to tertiary education, as salary expenditures for basic and secondary education –the largest component of district routine expenditures– are financed through the DAU transfer and accounted for as sub-national expenditures.

Table 6 Social Returns to Education Per Level of Education 2004

| Level of Education | Rate of Return |
|--------------------|----------------|
| Primary education | .04 |
| Junior secondary | .25 |
| Senior secondary | .28 |

Source: Author's calculations.

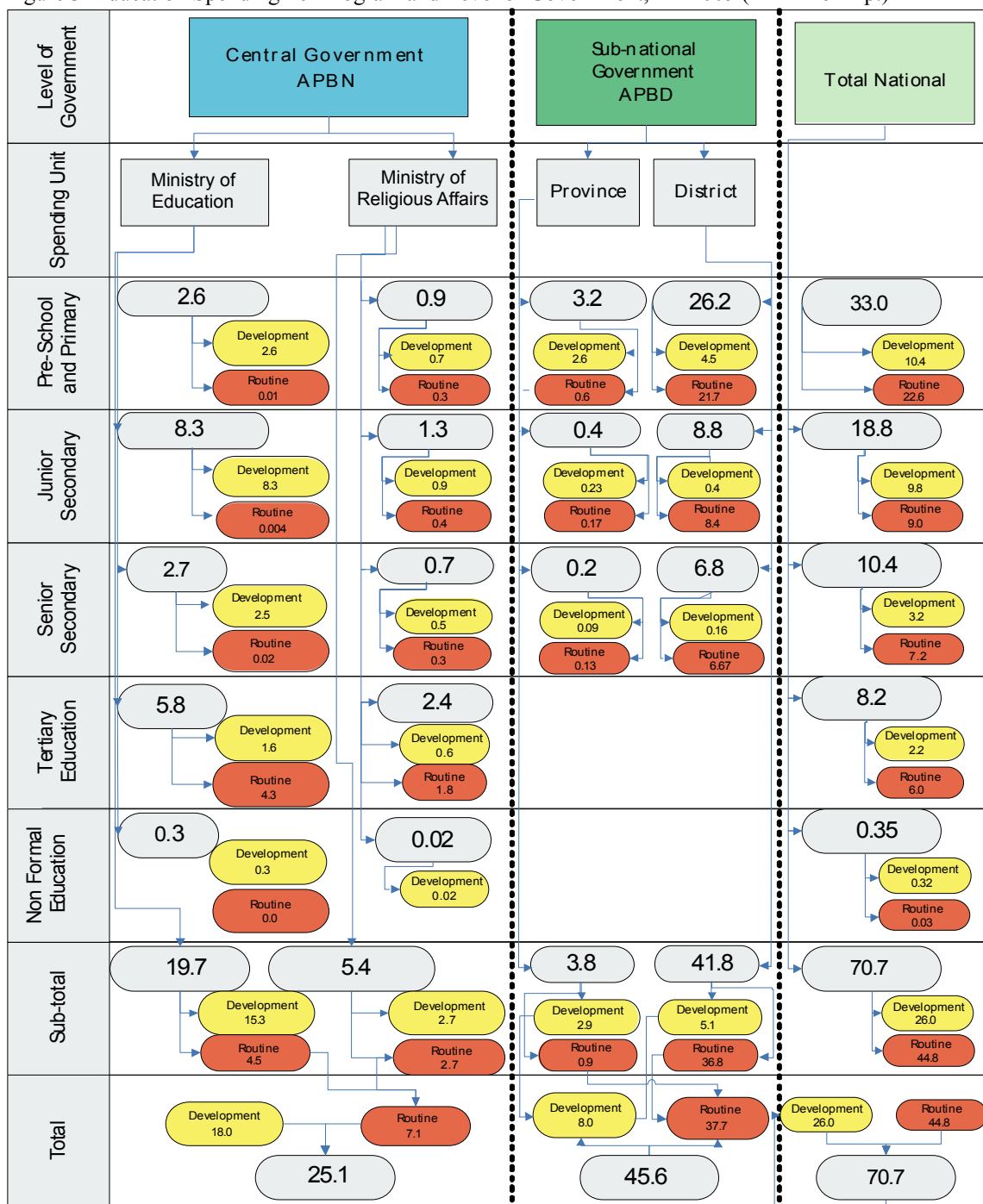
Identifying the optimal allocation of resources across education programs is crucial if the government is to increase education spending, as is suggested by the Constitutional Court. The low levels of enrollment rates of junior secondary education are a clear sign that larger efforts are required to improve access to this level of education. In addition, social rates of return in secondary education are higher than in primary education. Cost-benefit analysis yields useful insights by comparing education programs based on their returns to society. Estimates of the returns to education investments are defined as the discount rates that equate a stream of education benefits to a stream of costs for providing education, at different levels, at a given point in time. The senior secondary level achieves the highest rates of return with 28 percent, slightly above the junior secondary school level, with 25 percent. By contrast, primary education is low with an estimated 4 percent (Table 6).¹⁴

¹² See Renstra, MoNE, 2005.

¹³ While spending per student is actually higher for junior education, this does not indicate an adequate level of spending at that level. It reflects the fact that costs of secondary education provision are typically higher and that the number of enrolled students in junior secondary education is low.

¹⁴ Education benefits were computed based in wage differentials (additional average earnings from those of the same age group at a previous level of education) from the Indonesian Labor Force Survey (Sakernas) 2006, and education costs from unit cost estimations reported by MoNE (2005). See Annex 2 for further information on the methodology employed for this computation. These calculations are currently being revised and modifications might be included in the next draft of this paper. See Annex 2 for a more thorough discussion on the methodology employed for the computation of social rates of returns to education.

Figure 3 Education Spending Per Program and Level of Government, FY 2005 (in Trillion Rp.)



Source: Computed by World Bank staff based on MoF and SIKD data. Reported figures do not necessarily add up to totals due to rounding.

Note: The functional classification includes sub sectors Education (11.1) and Non-formal Education (11.2) while two other sub sectors (11.3 and 11.4) are aggregated under Tourism and Culture function (08). The Education function also includes the Religious Education sub sector (15.2).

Indonesia is spending more per student the higher the level of education and this is consistent with international experience. In Indonesia, expenditure per pupil in junior secondary education is approximately 2.5 times that of primary education, whereas senior secondary education is 3.4 times more than primary. This is a typical phenomenon, as higher levels of education require more expensive inputs, but it is more pronounced in Indonesia than in other countries (UNESCO, 2005). The gap is particularly significant at the primary level; it then narrows at the secondary and tertiary levels of education.

Allocations to the School Level

Multiple sources contribute to school budgets, with the lion's share coming from district governments before 2005. According to the GDS 1+ survey for budget data for 2002–03, 92 percent of primary school budgets are funded by district governments. This large share decreases in junior and senior secondary schools to 82 percent and 77 percent respectively, as the share of parental contributions increases from 4 percent in primary to 13 percent in junior secondary and 17 percent in senior secondary (World Bank, 2006a). However, a new allocation mechanism, introduced in July 2005, significantly altered school budgets at the primary and junior secondary levels. The change is that the central government now funds a substantial share of the schools' operational income.

A new financing mechanism, introduced in 2005, significantly altered the composition of operational revenue sources at the school level, by allocating resources directly to schools. From 2001 to June 2005, the government allocated part of its fuel subsidy savings to a scholarship program (known as BKM) for poorer families. For the period July–December 2005, the GoI decided to change the direct recipient of the funds from households to schools by allocating block grants for school operational costs through the Operational Aid to Schools Program (Bantuan Operasional Sekolah, or BOS). Since July 2005, the GOI grants BOS resources to all schools at the primary and junior secondary levels while still partially continuing the BKM Scholarship program.¹⁵ The BOS program is distributed to schools based on a per-pupil allocation mechanism.

The BOS program covers approximately 41 million students, of which 62 percent are at the primary school level and 38 percent at the junior secondary level (Table 7). The program disbursed Rp. 5.3 trillion from June–December 2005 and has started the transfer of Rp. 11.12 trillion for 2006, which equates to approximately 25 percent of the overall central budget for education.

Table 7 Operational Aid to Schools per Level of Education 2006

| | Students (million) | BOS Allocation (trillion Rupiah) |
|-------------------|--------------------|----------------------------------|
| SD/MI | 29.4 | 6.92 |
| SMP/MTs | 10.5 | 3.40 |
| BKM | 0.7 | 0.54 |
| Safeguarding Fund | - | 0.26 |
| Total | 40.6 | 11.12 |

Source: MoNE 2006.

The BOS resources are transferred directly to schools on the basis of a per-pupil allocation formula. Schools set up bank accounts in which the funds are directly deposited, reducing the possibility of leakage and providing greater transparency. Primary schools receive Rp. 235,000 (~US\$ 25) per pupil per semester, and junior secondary schools receive Rp. 324,500 (~US\$ 35).

¹⁵ The schools that choose to participate in the program must sign a Letter of Agreement on the Provision of Aid. If a school agrees to take the funding Operational Aid from government, then they must comply with rules on the charging of fees including registration form cost, principal textbooks and supporting materials from library, cost for teachers training, examination fees, and activity fee. See also the forthcoming Poverty Assessment (World Bank 2006) on the poverty impact of the BOS program.

The government is debating a potential increase in the level of the grant, as MoNE requested an increase for primary students to Rp. 300,000, and for junior secondary students to Rp. 420,000. Given the fact that the current numbers are based on unit cost calculations at 2003 fixed nominal prices, increasing the level of the per-pupil funds is desirable.¹⁶ What is problematic is that the amount per student is set nationally and does not take into account regional price fluctuations. Although this is only a problem in certain regions, it can significantly reduce the purchasing power of the transfer. For example, in Aceh, where inflation fluctuates around a level of 20 percent, the province's BOS funds will in effect finance around 20 percent less operational goods and services than it would elsewhere.

BOS funds are to cover operational costs and are intended to thereby lower or even eliminate school fees. There are guidelines on the use of the funds, but the schools still have a fair amount of discretion on how the funds are spent. Schools in which the total amount collected in school fees is lower than the amount received in BOS grants are mandated to eliminate school fees all together. Schools that collect more in school fees are supposed to eliminate fees in an amount equivalent to the grant received, while giving priority to poor students. This latter provision avoids discouraging schools with fee collections higher than BOS from receiving the grant. The reason is that if these schools were also required to completely eliminate school fees, the grant would actually lead to a decrease in the operational budget.

Box 1 What can BOS Funds be used for?

- Operational costs related to the registration of new students
- Text books and reference books
- Stationary and other daily school needs
- Remedial teaching programs, sports, art
- School examination costs and student report cards
- Teacher development and training
- School repairs and maintenance
- Electricity, water, telephone
- Remuneration of honorarium teachers
- Transport costs for poor students
- Religious equipment and dormitory facilities
- BOS program operational costs
- If BOS has already been used for all of the components above, funds can be used to buy sporting equipment, study materials, furniture.

Source: MoNE (2006)—BOS Guidelines

One recent evaluation of the program indicates that it had a positive impact and was successful in various areas. Nonetheless, it still has many issues to overcome.¹⁷ From a financing standpoint, the method of allocation has had both positive and negative effects. They include:

- The direct transfer of funds allows for little leakage, as almost all schools received their full funds (although sometimes with delays). However, the evaluation of the program points toward problems with channeling in some areas. Although the provinces are designated to appoint the channeling institution for the funds, this arrangement has not always resulted in the most efficient and practical outcomes. In several regions, schools had to open new accounts; in other regions, they were allowed to use an existing school account. The opening of a new account was an extra burden for schools, as sometimes even an initial deposit is required. In addition, it was reported that, sometimes, due to a lack of socialization for banks, the BOS accounts were signed and accessible solely by the principal of the school without the treasurer. Allowing only one person access with no supervision could have led to the misuse of funds.
- Lower fees due to the program may encourage more children from poor households to attend school. While desired, the latter is an indirect effect as the program does not directly target poor households, schools, or districts. Although the BOS program encourages giving priority to the poor when spending the resources (transportation, school uniforms), the evaluation found that almost all schools gave the same treatment to students from well off and less well-off families in terms of sharing the burden of school costs.

¹⁶ These unit costs cover operational expenses only. The salary component of traditional unit cost calculations (approximately 80 percent) is omitted here.

¹⁷ This report was conducted by SMERU in conjunction with the World Bank.

- The distribution mechanism may be distorted as schools have an incentive to inflate the reported numbers of students enrolled. On the positive side, however, mechanisms based on per-student distribution of resources provide incentives for pro-poor expansion of enrollment.
- Since provinces and districts are bypassed, the program tends to recentralize development spending, which goes against the notion of decentralization.
- The program does not demand measures of good performance or budget transparency from schools, which makes it difficult to assess its actual impact and the adequate use of funds. While the school should be able to best identify its needs, there is evidence that the funds may not be spent effectively. For example, according to the study, extra teachers were hired in schools that already had extremely low student-teacher ratios.

Increasing the Resource Envelope: The 20 percent Spending Mandate

The size of the education spending envelope in the 2006 budget has been the topic of intense debate as the National Teacher Association (PGRI) requested the Constitutional Court to review the level of expenditures and assess whether they are in accordance with the law. Indonesia has long had an article in its Constitution stipulating that the government should spend at least 20 percent of its central and regional budget to education. Furthermore, since 2003, teacher salaries are no longer to be counted toward this 20 percent benchmark, putting pressure on the government to increase discretionary spending to the sector

Box 2 Legal Background of Indonesia's "20 Percent Rule"

- 1945: Indonesian Constitution stipulates in Article 31 (4): "The state should allocate a minimum of 20 percent from the APBN budget and APBD budget to education expenditures, to respond to national education needs."
- 2002: Nearly 60 years later in 2002, this Constitution article was amended to specify: "The state prioritizes a budget for education of at least 20 percent from the national budget and regional budgets to fulfill the needs of providing national education." The 2002 amendment was ruled by the People's Consultative Assembly (MPR).
- 2003: Later, the Education Law 20/2003 on the National Education System (part 4, art. 49) again redefines the 2002 benchmark. The 2003 law narrows the range of spending items that count toward the 20 percent target by excluding salaries. As stated: "Education funds, excluding salary of educators and service education expenditure, are allocated at a minimum 20 percent of the APBN and a minimum of the APBD."

Addressing the questions raised on this national debate entails the analysis of at least three basic dimensions:

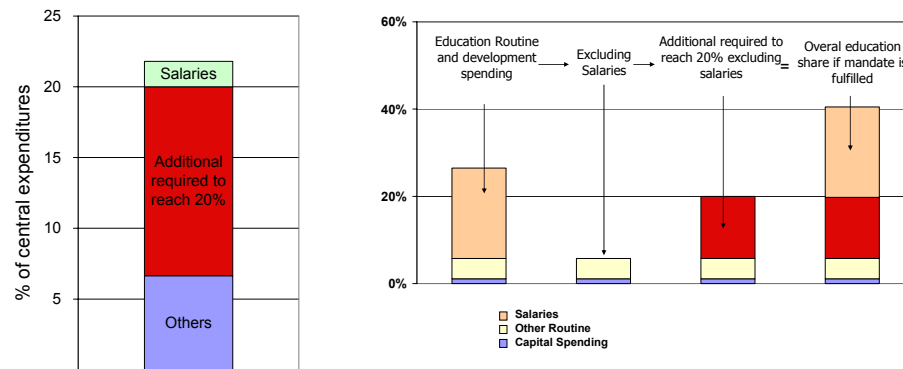
1. Reviewing the adequacy of the level of the earmark at 20 percent, and the very existence of a target of this type (as opposed to an expenditure formula based on education needs).
2. Clarifying the various ways in which the education law has been interpreted, and examining whether current levels of expenditures at the national and sub-national levels comply with the set standards.
3. Defining how to allocate additional spending to different programs and other inputs, if additional spending in education would be required.

In 2006, the central government allocated approximately Rp. 44.1 trillion, or ~9.4 percent, of the total central government budget to the education sector.¹⁸ When excluding personnel spending on teachers, as indicated in the 2003 Law, total central education government spending will account only for approximately 6.7 percent of the 2006 APBN (Figure 4). Calculating education expenditures in this manner, the level is insufficient to reach the stipulated 20 percent for the central government budget (APBN). Consequently, an additional Rp. 63 trillion, or 13.3 percent,

¹⁸ The education sector includes preschool education, primary education, secondary education, non-formal and informal education, education for civil service personnel, higher education, religious education, research and development for the education sector, education support services, and other spending on education.

of the budget would need to be reallocated to the education sector in order for the budget is to reach the 20 percent benchmark.

Figure 4 Central and Sub-National Budget Allocations to the Education Sector (2006)



Source:

World Bank staff estimates

Note: The estimation for central government includes all components if of the functional classification, that is, sub-functions 10.01-10.90. The personnel spending part of the bar aggregates personnel spending from each one of the education sub-functions.

Implementing the 20 percent rule within the current definition is unrealistic and problematic at the same time. Although the education 20 percent “rule” is still open for interpretation, various ways of computing the ratio have been examined. Most of them indicate that allocating 20 percent at the central or sub-national level, excluding salary expenditures appears unfeasible (see annex 8 for a simulation of education spending ratios under alternative definitions).

- At the central level, the 2006 budget allocates an estimated 9.4 percent of the budget in education (Rp. 44.1 trillion). Excluding personnel spending, this share declines to approximately 6.7 percent (Table 8).
- At the sub-national level, in 2005, education expenditures accounted for 26 percent of the sub-national total expenditures (Rp. 46 Tr. from a total sub-national spending—APBD I + APBD II—of Rp. 172 trillion). Yet, as much as 78 percent of this amount was absorbed by personnel expenses. Excluding personnel spending, education sub-national spending accounts for only 6.1 percent of total sub-national expenditures (Table 8).
- If the education programs from all levels of government, all line ministries, and other government institutions, as well as spending on salaries were counted as education expenditures, the share of national education spending in the national budget (APBN + APBD I + APBD II) was 16.5 percent in 2006 (Table 8).

Excluding personnel expenditures, national and sub-national education spending is significantly lower than the target stipulated by the Education Law. Note, however, that since decentralization of education service delivery, which became effective in 2001, teachers’ salaries constitute the major share of sub-national expenditures on education. If local governments would allocate the additional Rp. 21 trillion necessary to reach the 20 percent target, excluding teachers’ salaries, the overall share of education spending at the sub-national level would account for as much as 45 percent of the total APBD. To increase the share of education spending in APBD net of salaries, districts and provinces would need to make significant reductions in the shares of other sectors. Doing so may not be politically possible or desirable on several grounds.

Table 8 Education Spending as a Percentage of Central Sub-National and National Spending
Percentage, 2006 central, 2005 subnational

| | Education spending share (excluding salaries) | Education spending share (incl. salaries) | Share of level of government in total national spending |
|--------------------------|--|--|---|
| Central government | 6.7 | 8.5 | 64 |
| Sub-national governments | 5.7 | 26.5 | 36 |
| Total National | 6.9 | 16.5 | 100 |

Source: World Bank staff estimates

Note: See Annex 8 for alternative definitions and computations of the 20 percent rule.

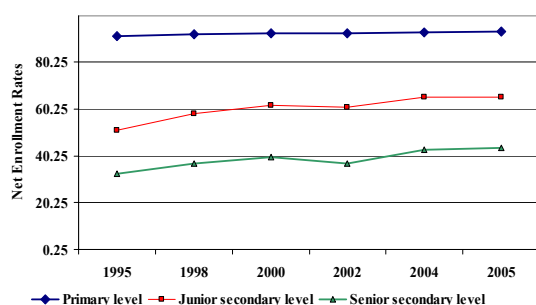
The 20 percent earmark puts pressure on the central government to engage in education spending at the district level, which is not consistent with decentralization. The target stipulated for both levels of government is not based on an estimation of the financing needs arising from the intergovernmental distribution of education functions or the vertical distribution of fiscal resources. When MoNE is supposed to have devolved most of its functions to local governments, earmarking 20 percent of the APBN may be well intentioned but has disadvantages. Earmarking forces MoNE to develop its own spending programs in the regions. This dynamic implies that most of the capital investments in education would be centralized and outside the control of district governments.

3. Education Public Expenditures and Equity

Equity in Enrollment Rates across Levels and Regions

Education expenditures in Indonesia are mostly directed to the primary school level, which usually tends to be pro-poor. Primary school level absorbs more than half of the education expenditures by central, provincial, and district governments combined. Spending on this level tends to be pro-poor, as a larger proportion of the poor attending school are at the primary level. In contrast, only six percent of the junior secondary level belongs to the poorest quintile of the population, whereas the analogous figure at the secondary level is approximately three percent.

Figure 5 Net Enrollment Rates Time Trend



Source: World Bank staff calculations based on data from Susenas 1998–2005.

this law is not strictly enforced. While access to primary schooling may still be a problem in remote areas, for most of the poor in Indonesia the most pressing educational access issue concerns the transition to junior secondary schooling.

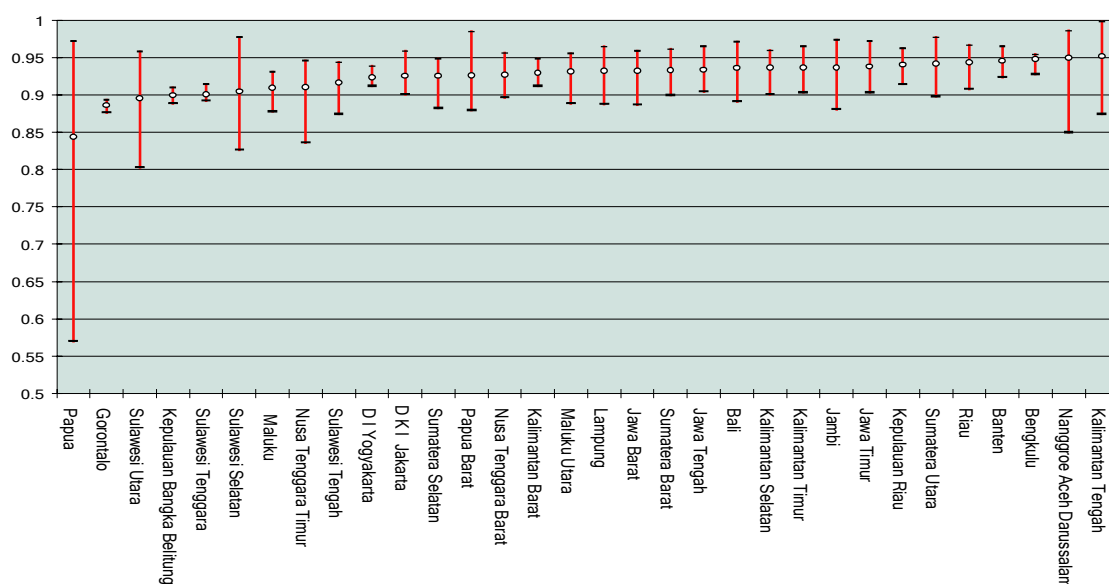
Indonesia's past enrollment expansion reduced the enrollment gap across income groups at the primary education level. However, striking inequalities remain at the junior secondary and senior secondary levels (Figure 5). In 2005, the primary school enrollment rates were 105 percent gross and 91 percent net. Problems with access become more significant at the junior secondary school level, at which the gross enrollment rate was 81 percent and net enrollment rate declined to 62 percent. Officially, basic education (grades 1–9) is compulsory for children aged 7–15. However,

However, enrollment rates in Indonesia still vary widely by region and these regional gaps are pronounced than the enrollment gaps in income levels. The poor's likelihood of enrollment varies by region, even within the same income quintile. The poor in Papua have low net enrollment rates even at primary school level (80 percent). In fact the regional differences dominate conditions to such an extent that the richest quintile in Papua still has lower enrollment rates (92 percent) than

the poorest quintile in Sumatra (World Bank 2006). At the junior secondary school level, the level of access varies even more widely across provinces. Indonesia has almost universal enrollment at the primary level across provinces. However, vast differences in enrollment rates emerge for children between 13–15 years. While Jakarta and Yogyakarta achieved enrollment levels over 90 percent, the majority of provinces considered in this analysis fall below 80 percent. South and Central Sulawesi fall below 70.

Even for primary enrollment rates, the geographical differences are stark, particularly within provinces. The province of Kalimantan Tengah, ranks highest among all provinces, with an enrollment rate above 95 percent but enrollment rates of its districts fluctuate a lot. For example, the district Kota Palangkaraya has an enrollment rate of 88.4. This is lower than the overall enrollment rate of Gorontalo, which ranks second lowest of all provinces with an enrollment rate of 88.5 percent (Figure 6).

Figure 6 Primary Education: District Enrollment Rates within Provinces



Source: Susenas 2005.

However, inequality in net enrollment rates is decreasing in all levels of education. In primary schools, the variance enrollment gaps were reduced substantially from a variance of 31.9 (1998) to only 13.2 (2004). Also in junior and senior secondary education, the difference in enrollment gaps variance was reduced by almost half. Most of the geographical differences are driven by inequality within provinces, which is consistently explaining inequality by a factor of more than 2:1 compared to between province inequality.¹⁹ This means that inequality in net enrollment is every time less due to provinces lagging behind, and more due to specific districts lagging behind across all provinces (Table 9).

¹⁹ The “Between” mean square estimates the population variance based on the sum of squares of the province means multiplied by the number of districts (size of the samples). The “Within” mean square estimates the population variance based on the average of all sum of squares within the several provinces.

Table 9 Source of inequality in enrollment rates: Between and within provinces

| | Primary | | | | | Junior secondary | | | | | Senior secondary | | | | |
|------|-------------------|----------|------|------------------|------|------------------|----------|------|----------|------|------------------|----------|------|----------|------|
| | Between Provinces | | | Within provinces | | Between | | | Within | | Between | | | Within | |
| | Total | Variance | % | Variance | % | Total | Variance | % | Variance | % | Total | Variance | % | Variance | % |
| 1998 | 31.9 | 11.4 | 35.8 | 20.5 | 64.2 | 307.6 | 92.8 | 30.2 | 214.8 | 69.8 | 432.5 | 98.1 | 22.3 | 334.3 | 77.3 |
| 1999 | 23.3 | 9.1 | 39.1 | 14.2 | 60.9 | 313.2 | 109.2 | 34.9 | 204.0 | 65.1 | 436.6 | 117.3 | 26.9 | 319.3 | 73.1 |
| 2000 | 21.0 | 7.9 | 37.5 | 13.1 | 62.5 | 293.8 | 96.8 | 30.6 | 197.0 | 69.4 | 449.1 | 113.2 | 8.6 | 335.9 | 91.4 |
| 2001 | 21.4 | 8.0 | 37.2 | 13.5 | 62.8 | 295.6 | 78.5 | 26.6 | 217.1 | 73.4 | 418.2 | 112.0 | 26.8 | 306.2 | 73.2 |
| 2002 | 10.5 | 4.2 | 40.2 | 6.3 | 59.8 | 186.7 | 64.5 | 34.5 | 122.1 | 65.5 | 255.3 | 65.2 | 27.5 | 190.1 | 72.5 |
| 2003 | 19.7 | 7.1 | 35.9 | 12.6 | 64.1 | 161.3 | 57.3 | 35.5 | 104.0 | 64.5 | 273.3 | 63.9 | 23.4 | 209.4 | 76.6 |
| 2004 | 13.2 | 4.0 | 30.0 | 9.2 | 70.0 | 158.1 | 57.7 | 36.5 | 100.4 | 63.5 | 264.8 | 77.4 | 29.2 | 187.5 | 70.8 |

Source: Susenas 1997–2005.

Note: The between and within mean of squares are weighted by the share of their respective degrees of freedom (i.e. between No. provinces, and within No. districts).

Despite persisting disparities in enrollment among provinces, disparities have decreased over time whereas disparities among districts within provinces have increased, particularly at the primary level. In 1997 the disparity in enrollment rates among provinces at the primary level averaged 46 percent, while the disparity among districts within provinces averaged 54 percent. However, in 2002 the among-province disparity fell to 30.5 percent, while the within disparity increased to 69.5 percent. A similar pattern occurred at the junior secondary level.

Wide variation in primary net enrollment rates within provinces exists. Figure 6 portrays the average net enrollment of each province (middle dot) as well as the minimum (lower bound) and maximum (higher bound) rate of net enrollments within the districts in each province. The province of Kalimantan Tengah, ranks highest among all provinces, with an enrollment rate above 95 percent. Still, there is wide variation in the enrollment rates of the districts that make up Kalimantan Tengah. For example, the district of Kota Palangkaraya has an enrollment rate of 87.4. This is lower than the overall enrollment rate of Sulawesi Barat, which ranks second lowest of all provinces with an enrollment rate of 88.5 percent.

Equity of Spending Across Districts

Inequality in enrollment rates across districts is related, at least in part, to the level of education spending at the district level.²⁰ Regression analysis suggests that net enrollment rates are positively correlated with education spending per student and also with education spending as a share of overall district spending. However, the strength of the correlation between per-student spending and enrollment depends on the distribution of students across levels of education. That is, the correlation increases as the share of primary students enrolled increases. This correlation probably is explained by the fact that the unit cost for primary education is lower than for junior and senior secondary education.

Although the potential impact of additional spending on enrollment would be small, increasing per student spending might be part of the solution for increasing secondary enrollment rates. In particular, increasing or reallocating resources from personnel to non-personnel spending (goods and materials expenditures) appears to be positively correlated with enrollment.²¹

²⁰ Enrollment rates are most likely only in part determined by district level education expenditures, because the districts predominantly spend on personnel costs, which are not necessarily assumed to be positively correlated with enrollment rates. Additional analysis, including DAK spending and other central level expenditures on district education, is being undertaken because these resources constitute the largest share of expenditures on education infrastructure—assumed to be highly correlated with enrollment.

²¹ See Annex 3 Determinants of Education Net Enrollment for detailed regression outputs.

Table 10 District Expenditures on Education Per Poverty Quintile

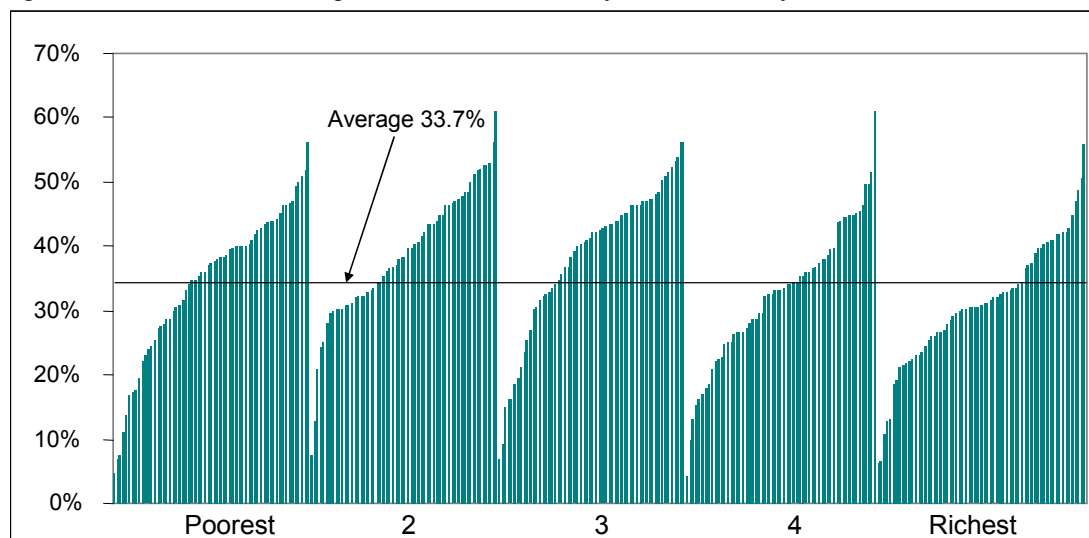
| District Quintile | Per Capita Total District Expenditure | | Education Expenditure per Public School Student | | Education as % of Overall Expenditures | | Non-personnel Ed. As % Total Expenditure | |
|-------------------|---------------------------------------|----------------|---|------------------|--|-------------|--|------------|
| | 2001 | 2004 | 2001 | 2004 | 2001 | 2004 | 2001 | 2004 |
| Poorest | 362,803 | 483,267 | 971,317 | 1,352,035 | 40.2 | 36.7 | 4.2 | 3.0 |
| 2 | 453,519 | 691,846 | 823,586 | 1,211,916 | 39.7 | 37.7 | 4.5 | 4.9 |
| 3 | 526,457 | 579,376 | 880,106 | 1,144,265 | 40.6 | 34.5 | 6.5 | 3.1 |
| 4 | 537,909 | 655,543 | 991,885 | 1,382,091 | 37.0 | 34.0 | 4.6 | 6.3 |
| Richest | 1,060,905 | 899,397 | 953,344 | 1,551,652 | 32.0 | 32.1 | 4.8 | 3.4 |
| All | 551,528 | 658,103 | 923,330 | 1,323,301 | 37.9 | 35.0 | 4.9 | 4.1 |

Source: World Bank district expenditure data, 2001-2004

Education spending patterns at the district level indicate that rich districts have not only higher per-capita expenditure on education but also higher per-student expenditure. The latter can in part be explained by the fact that richer districts have more students in higher levels of education where unit costs tend to be higher. An overview of expenditure by poverty quintile at the district level reveals that rich districts (particularly quintiles 4 and 5) tend to spend more on education per student, but the poorest districts are not too far behind (Table 10).

Poorer districts tend to exert a greater fiscal effort as they allocate a higher proportion of their budgets to the sector (34 percent in poorest districts vs. 31 percent in richest districts). The 40 percent poorest districts spend, on average, 35.4 percent of their budget in education, while the richer districts spend 31.5 percent. The distribution of each district's budget share in education aggregated by quintiles (based on poverty rates and household consumption) depicts that a greater number of districts in the lower quintiles have education spending shares above the national average of 34 percent (Figure 7).

Figure 7 Percent of District Expenditure on Education by District Poverty Quintile



Source: World Bank district expenditure data. Note: based on data of 350 districts; newer districts tend to not have data. Quintiles based on 2004 BPS poverty quintiles 77

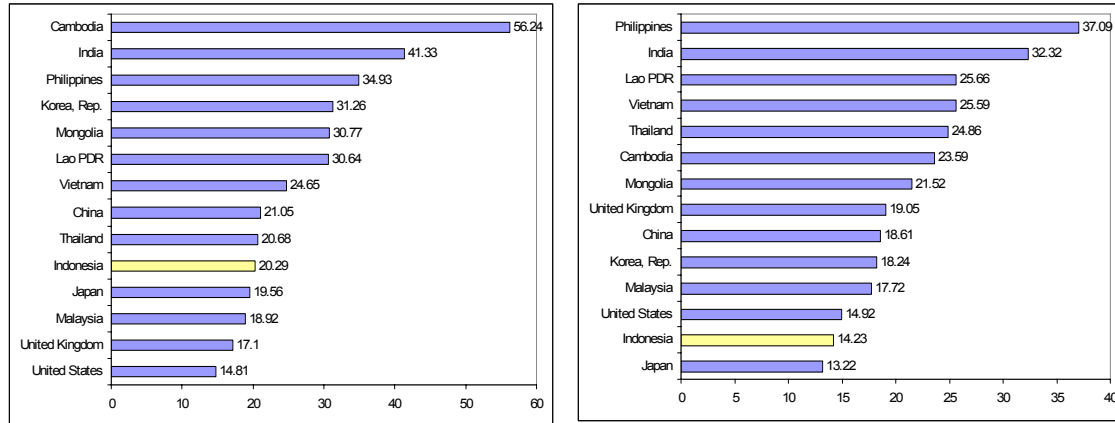
Hence, poorer districts are not necessarily lagging behind due to insufficient spending as a share of their budgets. Rather, inequalities likely result from lower overall allocations to the sector. Thus, an increase in their overall budget levels might be desirable. This increase could be combined with a continued effort to spend reasonable budget shares on the education sector.

4. Education Public Expenditures, Efficiency, and Outcomes

Although education budgets are increasing, Indonesia's extremely low student-teacher ratios (STR) suggest inefficiencies in sector spending. While low STRs provide the potential quality

benefit of more teacher-student interaction, general consensus is that a STR of 30:1 is optimal and that levels below this have very low marginal returns. Since teacher salaries are a significant cost, a low STR tends to have a high financial burden. Indonesia has one of the lowest student-teacher ratios in the region, as is illustrated in Figure 8 (left hand side). Comparable STRs for Asia/Pacific countries are around 31:1 for primary and 25:1 for junior secondary.²² Indonesia's rates are significantly lower, at ~20 and ~14 for primary and junior secondary respectively (Figure 8, right hand side). Indonesia's ratios are on par or even lower than the ratios in the US and many European countries. It is also well below Indonesia's national policy regarding STRs, which is set at 40:1 for primary and 28:1 for junior secondary.²³

Figure 8 Primary and Secondary School Student -Teacher Ratios by Selected Countries, 2003



Source: Edstats 2003.

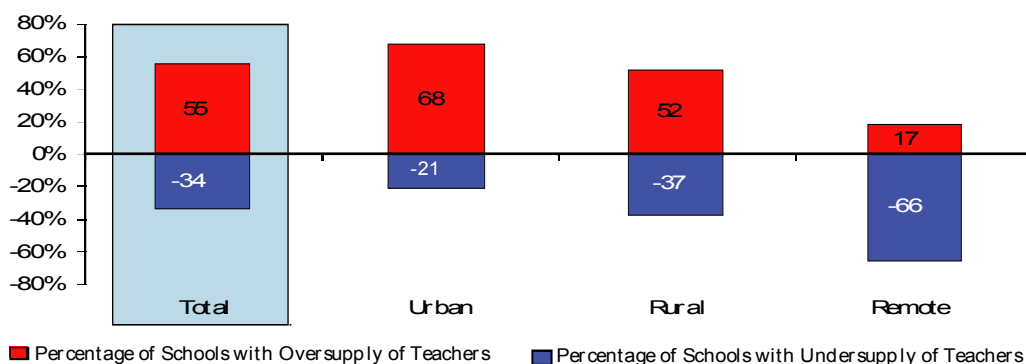
The supply issue is in part related to distribution inefficiencies. Based on the standards set by the current staffing entitlement formula for primary school (9 teachers minimum and a target STR of 40:1), approximately 55 percent of schools are oversupplied, while 34 percent are undersupplied (Figure 9).²⁴ Inequities in distribution are particularly evident when looking at supply of teachers in urban, rural and remote schools. Urban and rural areas schools have substantial oversupplies (with 68 percent and 52 percent of the schools having an oversupply, respectively), while remote schools have serious teacher shortages, with 66 percent of the schools being undersupplied. The government's new policy of doubling the base salary for teachers working in remote schools should encourage teachers to work in remote schools.

²² Source: EdStats database. Primary ratio clearly defined with weighted ratio, but secondary ratio estimated by authors due to unavailability of data.

²³ World Bank 2006, 'Potential for significant equity, efficiency and quality improvement: Teacher employment and deployment in Indonesia'

²⁴ The total over and undersupply is calculated based on 2005 Employment and Deployment survey results of urban, rural and remote schools. The total is weighted based on 2004 Susenas calculations on the percent of 7-15 year olds living in urban and rural areas and an assumption that 10 of schools are remote. Part-time teachers are calculated to become full time equivalents.

Figure 9 Percent of Primary Schools with Oversupply, Undersupply by Region



Source: Employment and Deployment Survey 2005.

Note: Based on Current Entitlement Formula

The current method of determining teacher supply requirements encourages oversupply. Under the current system, schools submit their teacher supply requirements to the district office. The districts then request the number of additional teachers required from the central education office. The central office subsequently allocates teachers to districts and provides the additional teacher salaries through DAU. Under this system, the schools and districts – which do not actually pay the salaries – have a strong incentive to claim undersupply and request additional (and largely free) resources, with little incentive to use teacher resources efficiently. This is shown in practice, where schools almost always claim an undersupply, even when they have a large oversupply. In a 2005 survey of 276 primary schools, 65 percent of the schools claimed to have an undersupply while only 8 percent claimed an oversupply. However, according to the entitlement formula, 55 percent show oversupply while 34 percent show an undersupply (Table 11). Of the schools that claimed an undersupply, 41 percent actually had an oversupply.

Table 11 Primary School Claimed vs. Estimated Oversupply and Undersupply

| | Claimed | | | | Actual Entitlement | | | |
|--------|-----------------------|------------------------------|---------------------|------------------------------|---------------------|-----------------------------|--------------------|-------------------------------|
| | Oversupply | | Undersupply | | Oversupply | | Undersupply | |
| | Percentage of Schools | Average No. of Teachers Over | Percent. of Schools | Average No of Teachers Under | Percent. of Schools | Average No of Teachers Over | Percent of Schools | Average No. of Teachers Under |
| Urban | 8 | 2.8 | 58 | (2.1) | 68 | 3.8 | 21 | (2.2) |
| Rural | 10 | 1.9 | 65 | (3.1) | 52 | 2.8 | 37 | (2.7) |
| Remote | 0 | 0.0 | 90 | (4.5) | 17 | 0.0 | 66 | (4.3) |
| All* | 8 | 2.0 | 65 | (2.8) | 55 | 2.9 | 34 | (2.9) |

Source: Employment and Deployment Survey 2005.

Note: * Weighted average. The percentage of schools does not add up to 100 because the schools that show the correct allocation are not included in the table: Employment and Deployment Survey, 2005

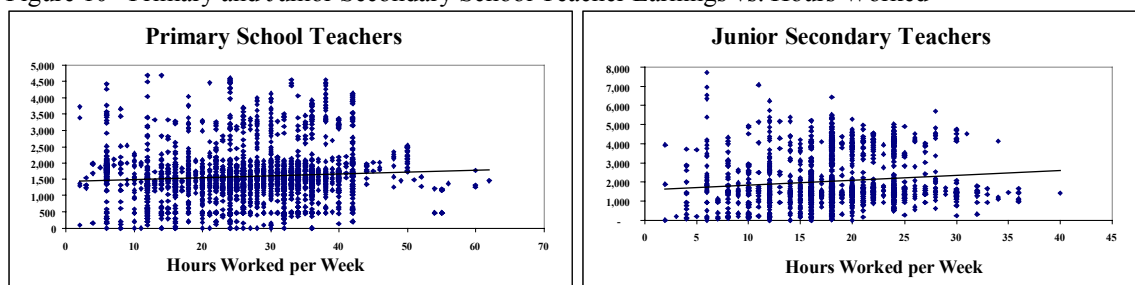
Figures are based on Current Entitlement Formula

When considering the oversupply of teachers, it is important to take into account Indonesia's large share of part-time teachers. About 6 percent of Indonesia's primary school teachers and 25 percent of public secondary school teachers work part-time,²⁵ which has also added claims of an undersupply of teachers in certain areas. Taking this into account nevertheless only reduces the cost burden of the current personnel system only slightly, because part-time teachers' salaries, on average, are not significantly lower than salaries of their full-time colleagues. As indicated in Figure 10, primary school teacher salary (including district and school incentives) varies surprisingly little based on hours worked. This is true for secondary school teachers as well. The fact that part-time teachers do not earn significantly less than regular teachers means that they are actually more expensive on a per-hour basis. At the secondary school level, subject experts are often hired on a part-time basis. In order to increase cost-effectiveness however, these teachers should be encouraged to improve their certifications to ensure full-time employability. At the primary level there are fewer part-time teachers (6 percent nationally), although primary teachers

²⁵ When private school is taking into account, the percentage of secondary school teachers is 39 percent.

often have responsibilities other than classroom teaching and many tend to work fewer hours than the average classroom teacher.²⁶

Figure 10 Primary and Junior Secondary School Teacher Earnings vs. Hours Worked²⁷



Source: Employment and Deployment Survey 2005.

Note: the earnings scales for primary and junior secondary teacher are different in the graphs above. Junior secondary teachers earn more on average.

Table 12 Primary Teacher Absence Rate in Public Schools 2002-2003

| Country | Absence Rate |
|------------------|--------------|
| Peru | 11 |
| Ecuador | 14 |
| Papua New Guinea | 15 |
| Bangladesh | 16 |
| Zambia | 17 |
| Indonesia | 19 |
| India | 25 |
| Uganda | 27 |

Source : Chaudhury 2004.

Indonesia is also not achieving the full impact of its education work force, because of high teacher absenteeism. A multi-country survey of teacher absence in primary schools found that Indonesian teachers were more likely to be absent from the classroom than those from five of the eight countries surveyed. In Indonesia, approximately one in every five teachers is absent at any given point in time (Table 12).²⁸ Teacher absence in primary school is 19 percent. This may in part explain why many schools feel they are undersupplied and indicates that a strategy to address the supply issue should include better monitoring and incentives aimed at changing teacher behavior.

The combination of a high number of part-time teachers and substantial rates of absenteeism, explains in part why class sizes are substantially larger than student-teacher ratios (Table 13). If all teachers were regularly teaching, the average would be 17 students per teacher, one of the best ratios in the world. However, due of the large part-time workforce and high rates of absenteeism, the student-class ratio is important to keep in mind when looking at the student-teacher ratio. In Indonesia, there are large differences between the two ratios. For example, at the junior secondary

²⁶ For example, at the primary level, 20 percent of the teachers are sports and religion teachers, and another 11 percent are headmasters, who often still assume teaching responsibilities in smaller schools, but have more of a managerial role in larger schools (see Annex 7).

²⁷ Headmasters have been kept in the graphs because they are considered to be part of the teacher workforce, but it is important to note that they are supposed to work only 6 hours a week in class, particularly in larger schools. Sports and religion teachers tend to be assigned 12 hours per week.

²⁸ Primary teacher absence rate is the percentage of full-time teachers who were absent from a random sample of primary schools during surprise visits. Enumerators made two to three rounds of unannounced visits to each school over a period of weeks or months, to get a more accurate estimate of absence and, after verifying workers' schedules, recorded which of them were absent. The data provide the number of teachers who were supposed to be on duty but were in fact absent from the school, without regard to the reasons for absence. Many personnel were absent for valid reasons, such as authorized leave or official duties. Nevertheless, these absence rates are useful for two reasons: first, because the reasons for absence given by facility directors were typically not verifiable; and second, because even authorized absences reduce the quantity and quality of public services in these primary schools. The study covered 147 public and private schools in 10 districts in Indonesia (Chaudhury et al. 2004).

level the average STR is 14:1, but the average student/class ratio is more than double (37:1), which implies that the average class is taught by 2.6 teachers.²⁹

Table 13 Student-Teacher and Student-Class ratios 2003-2004

| Level of Education: | Student -Teacher Ratio | Student - Class Ratio |
|----------------------------|-------------------------------|------------------------------|
| Primary | 20 | 25 |
| Junior Secondary | 14 | 37 |
| Senior Secondary | 12 | 36 |
| Average: | 17 | 28 |

Source: MoNE, 2004.

The bottom line from a financing perspective is that the oversupply presents a significant cost-burden. Using realistic STRs³⁰ that follow international best practice and are in line with the regional average, Indonesia shows a teacher oversupply of approximately 21 percent (Annex 6). Even when using a conservative estimate and taking into account the large part-time teacher workforce, the cost for primary and junior secondary schools alone reaches over Rp. 5 trillion, or approximately 8 percent of the total education budget. This cost will be exacerbated when teacher wages are significantly increased due new incentives specified in the 2005 Teacher Law (discussed in detail in the next section).

A more efficient teacher supply method in the longer term may be to provide funds to schools on a per pupil basis and then allow the schools to hire the number of teachers they believe are required. While the current method of providing teacher salaries through the DAU encourages schools and districts to request more teachers from the central government, having the teacher salary come out of the school's budget would encourage schools to be efficient in the number of teachers hired. It would help in creating a more equitable distribution since salaries would only be available at the school level. It would also in part address issues of teacher absenteeism and hiring of part-time teachers, because schools would have the incentive to use their resources efficiently and ensure that their teachers are performing their assigned tasks. This mechanism, however, bypasses district governments and might make local responsibilities in terms of providing educational services more diffused. Schools would also require additional financial and administrative capacity.

²⁹ This is partly because many secondary schools employ subject experts. Often these teachers are hired on a full-time basis, but only teach part-time because they can only teach in their subject area.

³⁰ A proposed entitlement is a minimum of 4 teachers in every primary school and a target STR of 32:1 in primary and a minimum of 7 teachers in every junior secondary school and a target STR of 28:1, which results in an actual STR of 26:1 and 22:1 respectively.

Box 3 Responsibilities for Employment and Deployment of Teachers

Since decentralization, districts are responsible for employing all public school teachers except those in religious schools. These include all civil service teachers in public and private schools as well as honorary teachers, who previously were hired and paid by the government. Currently, wages for public teachers are transferred to the districts' budgets as part of the DAU transfer from central government. Even though district governments are responsible for hiring teachers and paying their salaries, ambiguities persist. For example, religious school teachers who are civil servants are managed by the education unit in the Ministry of Religious Affairs (MoRA), not by the districts. In addition, the salary levels and promotional and reward systems for civil servants are set centrally, although many districts provide teachers within their jurisdictions with supplementary benefits and incentives. Moreover, it is still not clear whether districts can reduce the teaching force by dismissing some civil service teachers, as they might want to do if they were to rationalize their student-teacher ratios. This problem is significant given that the majority of teachers at the primary and junior secondary levels are civil servants.

Civil and Non-Civil-Servant Teachers by Level of Education

| 2004–2005 | Civil servants | % | Non-civil servants | % |
|------------------|----------------|----|--------------------|----|
| Primary | 1,108,436 | 83 | 226,650 | 17 |
| Junior Secondary | 308,346 | 57 | 234,245 | 43 |
| Senior Secondary | 170,381 | 39 | 265,085 | 61 |

Currently, many teachers are under the impression that they cannot apply for vacancies in other districts, but this perception may have arisen because districts often want to retain the civil servants whom they already employ. Nor are there any good mechanisms by which schools and districts can advertise teaching vacancies beyond district boundaries to recruit the teachers who may be the best suited to that particular school.

Sources: World Bank Education Sector Review 2005; WB-MoNE staff estimates.

TEACHER SALARIES, INCENTIVES, AND EDUCATION QUALITY

With the introduction of a new Teacher Law in December 2005, the GoI introduced a new teacher certification requirement which increases teacher remuneration, while also improving level of qualifications. Designing teacher salaries and incentive structures that attract and retain the best and the brightest candidates to the teaching profession is a complex task. This fact is particularly true for Indonesia, whose teacher salaries are considered relatively low. Low pay is likely a main reason that teachers perform poorly, have low morale, and tend to be poorly qualified. The level of teacher salaries in Indonesia, adjusted for purchasing power, is significantly lower than that of other countries.³¹

Box 4 Types of Teachers in Indonesia:

Indonesia has four types of teachers:

- Public teachers are civil servants who have minimum teacher qualifications.
- Contract teachers are fixed-term teachers who usually are employed through (donor-funded) projects and have the same qualifications as public teachers.
- Permanent teachers are engaged by foundations to teach in private schools. These teachers' qualifications vary by the quality of the school.
- Temporary teachers work in private and public schools and are paid by foundations. These teachers vary widely in their qualifications, and their wages can be very low (less than Rp. 100,000 a month).

Sources: World Bank Education Sector Review 2005, p.101 and MoNE data.

Indonesian teachers have one of the lowest salaries among these countries and for all scales and levels of education. Teacher salaries from a sample of the World Education Indicator (WEI) participant countries seem to indicate that Indonesian teachers are relatively poorly paid. (Table 14). Nevertheless, the results of cross-country comparisons are not always adequate in this type of analysis as some countries may offer additional incentives that are not captured in the comparison. Doubling teachers' payments through the country's extensive incentive structure still would leave salaries below the rest of sampled WEI countries other than Egypt.

³¹ See UNESCO-UIS/OECD 2005

Table 14 Comparison of Teacher Salaries in Selected World Education Indicator (WEI) Participant Countries

| Countries | | Primary Education | | Junior Secondary Education | | Senior Secondary Education | |
|------------------|----------------|-------------------|---------------------|----------------------------|---------------------|----------------------------|---------------------|
| Year | | Starting salary | Salary at top scale | Starting salary | Salary at top scale | Starting salary | Salary at top scale |
| Chile | 2003 | 11,709 | 18,437 | 11,709 | 18,473 | 11,709 | 19,302 |
| Egypt | 2002/03 | 1,046 | ... | 1,046 | ... | ... | ... |
| Indonesia | 2002/03 | 1,002 | 3,022 | 1,002 | 3,022 | 1,042 | 3,022 |
| Malaysia | 2002 | 9,230 | 17,470 | 13,480 | 29,151 | 13,480 | 29,151 |
| Paraguay | 2002 | 7,950 | 7,950 | 12,400 | 12,400 | 12,400 | 12,400 |
| Philippines | 2002/03 | 9,890 | 11,756 | 9,890 | 11,756 | 9,890 | 11,765 |
| Sri Lanka | 2002 | 3,100 | 3,945 | 3,100 | 4,509 | 3,945 | 5,073 |
| Thailand | 2003/04 | 6,048 | 28,345 | 6,048 | 28,345 | 6,048 | 28,345 |
| Uruguay | 2002 | 4,850 | 7,017 | 4,850 | 7,017 | 5,278 | 7,444 |
| OECD mean | 2003 | 24,287 | 40,539 | 26,241 | 43,477 | 27,455 | 45,948 |

Source: UNESCO-UIS/OECD 2005 Education Trends in Perspective: Analysis of the World Education Indicators.

Note: Figures are in USD

Nationally, however, when comparing wage levels of teachers to salaries of others with equivalent education, salaries turn out to vary by level of education and actually decrease as education increases. An analysis of Indonesia's 2004 Labor Force Survey (Sakernas) reveals that the monthly earnings of primary teachers with qualifications below the diploma level (approximately 40 percent of teachers), are 16 percent higher than the earnings of other paid workers. This differential decreases to 6 percent for teachers with a first- or second-level diploma (approximately 32 percent of teachers) but becomes negative for primary teachers with higher education. In particular, teachers with a third-level diploma (approximately 8 percent) or a university degree (approximately 19 percent) earn 21 percent and 35 percent less, respectively, than other workers with equivalent levels of education. These results suggest that teachers with relatively low levels of education are comparatively overpaid, while those with higher levels of education are relatively underpaid. It is noteworthy that these earnings trends create a disincentive for under-qualified teachers to attain additional education, because their wage relative to others with similar qualifications would decrease (Annex 7).

Teacher earnings are 21 percent lower than those of other paid workers with equivalent qualifications, and 26 percent lower than those of other civil servants.³² Further disaggregating teachers into those that teach primary and those that teach non-primary levels, the estimation results suggest that primary teachers are paid 6 to 18 percent less per month than other paid workers or civil servants, whereas the earnings differential for non-primary teachers is as high as 33 percent (Table 15).³³

Table 15 Monthly and Hourly Earnings of Primary and Non Primary Teachers Relative to Civil Servants and Other Workers

| Occupation | Relative to other workers (%) | | Relative to civil servants (%) | | Relative to other workers (%) | | Relative to civil servants (%) | |
|---------------------------------|-------------------------------|-------|--------------------------------|-------|-------------------------------|------|--------------------------------|-------|
| Teachers | 21 | Under | 26 | Under | 23 | Over | 19 | Under |
| Teachers primary | 6 | Under | 18 | Under | 46.9 | Over | 13 | Under |
| Teachers non- primary | 33 | Under | 32 | Under | 5 | Over | 23 | Under |
| Civil servants (excl. teachers) | 24 | Over | -- | -- | 46.7 | Over | -- | -- |

Source: World Bank staff calculations based on Sakernas 2004.

However, teacher hourly earnings compare rather favorably to those of other workers, because teachers tend to work fewer hours but are typically paid more per hour. According to data from

³² These estimates control for gender, age, urban or rural residence, and level of teacher education.

³³ These results are consistent with previous empirical studies based on the same data source; such as Filmer 2002, with a slight increase in the wage differential estimated for primary school teachers compared to other workers, changing from 2.5 to 6 percent (Annex 8).

the Sakernas 2004 survey, teachers reported to be working approximately 34 hours per week, while other paid workers with similar levels of education reported to be working 43–46 hours per week. Moreover, teachers have more holidays per year than other paid workers.

On the other hand, compared with other civil servants, teacher hourly earnings remain ~20 percent less on average, implying that civil servants are either working less than teachers, or are paid more per hour. Compared to their civil servant colleagues with similar levels of education, primary teachers earn approximately 13 percent less and non-primary teachers earn as much as 23 percent less per hour.

The Labor Force Survey further reveals significant regional differences in teachers' earnings. For example, teachers in East Java earn 23 percent less per month than teachers in West Java. However, other workers in East Java earn 16.5 percent less than workers in West Java do. Other places in which teachers earn substantially less than West Java are the large area of Central Java (14.7 percent), Nusa Tenggara Barat (NTB) (14.1 percent), and Banten (10.9 percent). Banten, Riau, and Bangka Belitung are provinces in which teachers earn substantially less than other workers. The same places have large differentials in terms of hourly earnings as well.

Table 16 Ministry of education's report of Qualified Teachers per Level of Education
(Percentage)

| Education Level | 1999/2000 | 2000/2001 | 2001/2002 | 2002/2003 | 2003/2004 |
|---------------------|-----------|-----------|-----------|-----------|-----------|
| TK/Kindergarten | 9.7 | 9.8 | 9.4 | 9.4 | 29.9 |
| SD/Primary School | 421 | 46.1 | 49.5 | 50.7 | 55.7 |
| SLTP/Junior SS | 60.0 | 64.0 | 64.0 | 64.1 | 72.5 |
| SM/Senior SS | 61.4 | 62.5 | 63.0 | 630 | 60.9 |
| PT/Higher Education | 35.5 | 41.6 | 43.7 | 48.5 | 47.6 |

Source: MoNE 2004/2005 teacher data.

Low remuneration is partly compensated by the additional allowances that teachers receive. However, just as do salaries, allowances paid to teachers tend to vary greatly, depending on wide-ranging local circumstances. There are various types of allowances, including district and school allowances. Field data from another World Bank study on teacher employment and deployment showed that 36 percent of primary teachers and 52 percent of junior secondary teachers received district allowances. This study also showed that 14 percent of primary teachers and 45 percent of junior secondary teachers received a school-level incentive. Inequities in remuneration turned out to be most apparent when districts were not in a position to pay allowances, compared to districts that were better off. Anecdotal evidence suggests that the generally low level of remuneration affects teacher motivation, attendance, and performance, and that it is not uncommon for teachers to have to take a second job to "make ends meet".³⁴

To ensure that teachers have an incentive to attain the proper qualifications, their wages need to correspond with these qualifications. The trends in earnings show that more highly educated teachers earn relatively less than less educated teachers when compared to salaries of workers with equivalent qualifications. Hence, to ensure that the majority of teachers without proper qualifications will become certified in the future, their current salaries should be increased. Higher current salaries are particularly urgent since educational quality is likely to be negatively affected by a large proportion of teachers being inadequately qualified. As recent data from the MoNE indicates, only 55 percent of primary school teachers and only approximately 73 percent of junior secondary and 61 percent senior secondary level teachers meet the appropriate qualifications.

A new Teacher Law, introduced December 2005, introduces an additional certification requirement that will significantly increase the level of routine spending on teacher wages (salary and incentives) over the next 10 years. The law stipulates that all teachers must be certified within

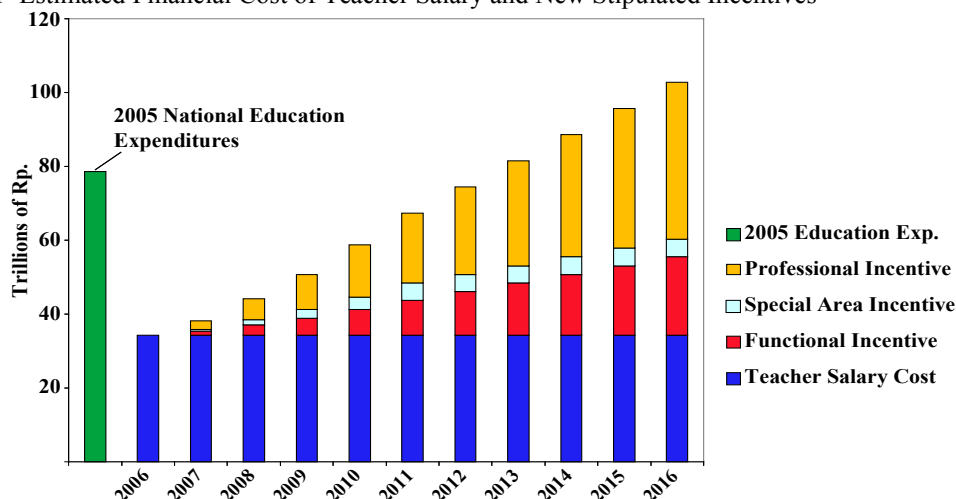
³⁴ World Bank (2006b).

10 years and that, upon certification, they will receive a professional allowance equivalent to their base salary plus a functional allowance equivalent to 50 percent of their base salary.³⁵ The law also specifies a special area allowance, which will be given to teachers in conflict, natural disaster, remote, and other hardship areas. Approximately 10 percent of teachers are expected to receive this special area allowance. Assuming that the teaching workforce remains the same and that all teachers become certified, the professional incentive will actually be greater than the current expenditures on teacher salaries because private school teachers are also eligible for the professional incentive.³⁶ The special area allowance will result in some teachers be receiving over three times their current base salary (base salary plus professional incentive plus special area incentive plus functional incentive).

Total expenditures on teachers will double within 8 years and exceed total education spending in 2005. Spending on the professional incentive will increase gradually each year as more teachers get certified (Figure 11). By 2016, an estimated Rp. 102.7 trillion will go toward salaries and incentives (130 percent of the entire 2005 national spending on education).³⁷ MoNE may be using the professional allowance to justify allocating more of the overall budget to the education sector. This action was stipulated in the Education Law's "20 percent" regulation, especially since these "allowances" are not to be labeled as "salary expenditures".

Increasing teacher salaries upon certification seems justified. However, if these increases crowd out other recurrent education expenditures, they are likely to negatively affect education outcomes. To reduce potential inefficiencies and lower the burden of increased teacher compensation, simultaneously tackling the oversupply of teachers is advised.

Figure 11 Estimated Financial Cost of Teacher Salary and New Stipulated Incentives



Source: World Bank staff estimates using MoNE 2004–05 teacher data.

Note: The amount and recipients of the functional incentive are still being discussed. See annex 4 for details

³⁵ The functional allowance is still being determined and details are to be specified in a ministerial decree. An October draft version of regulations which are expected to be passed in December 2006 specified that the functional allowance of 50 percent base salary would be given to certified teachers. This amount has now been removed from a November draft of the regulations. It has also been debated that the allowance will be given to all teachers and may be between Rp. 100,000 to 300,000 per month.

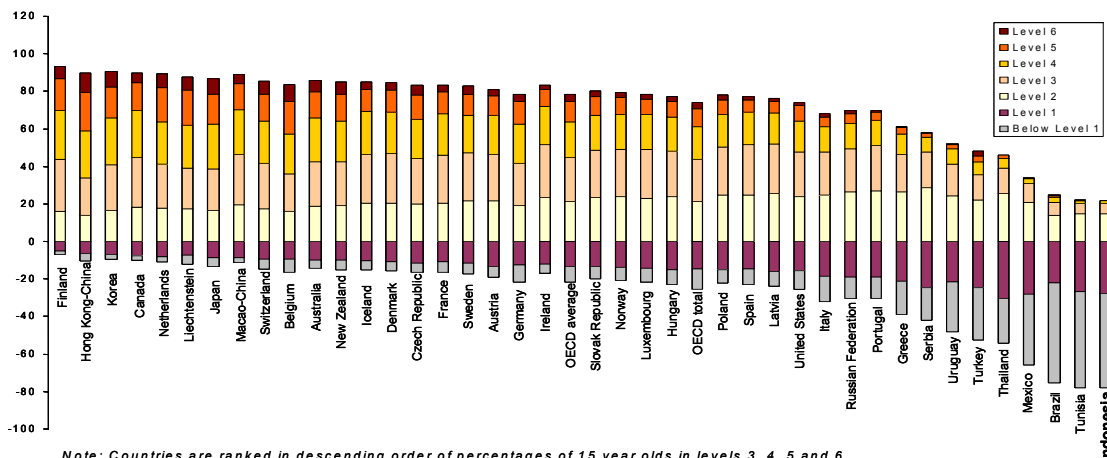
³⁶ This assumption is potentially inaccurate because, while the law states that all teachers are required to be certified within 10 years, it also requires that teachers hold an S1 or D4 degree before they can go through the certification process. Currently, only 20 percent of teachers in primary and secondary are at this level and many teachers are well below (for example, would need to get the equivalent of an additional 3–4 years of schooling).

³⁷ This estimation does not include district and school incentives, which are sometimes given to teachers.

There is a new emphasis on putting more resources towards improving the quality of education. Indonesia ranks low in international standardized tests—an expected outcome since Indonesia is one of a handful of lower-middle income countries that participated in them. In 2003 Indonesia ranked 34 out of 45 countries in the Third International Mathematics Science Study (TIMSS); Indonesian eighth graders had particularly low results in the higher cognitive areas such as problem-solving.³⁸ In the 2003 Program for International Student Assessment (PISA) examination, Indonesia ranked last out of 40 countries in both mathematics and language. Furthermore, on a proficiency scale from 0 to 6 for mathematics, over 50 percent of students did not reach level 1. In reading, only 31 percent could complete more than the most basic reading tasks (Figure 12).

These student outcomes in Indonesia were lower than in other countries even after taking family socioeconomic status into account. This finding suggests that school system deficiencies, rather than the poorer backgrounds of students, are responsible for poor performance (EFA Global Monitoring Report 2005). At the same time, however, one has to acknowledge that the PISA examination targets mostly developed or middle income countries and that Indonesia is one of the only lower-middle income countries in the group. The fact that Indonesia is participating in these tests is a positive sign that the GOI wants to measure student outcomes and determine ways to improve the quality of education.

Figure 12 Students at Each Level of Proficiency on the Mathematics Overall Scale (%)

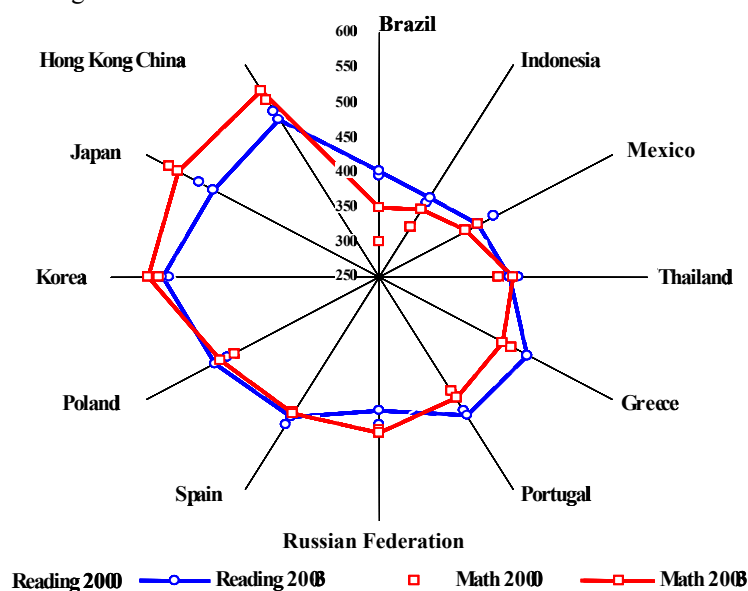


Source: PISA database 2003.

The trend of Indonesia's scores on international examinations shows a slight upward movement. Indonesia has participated in the PISA study for 2 consecutive rounds in 2000 and 2003. While Indonesian students remained behind comparable countries in the sample, they improved their performance in reading and mathematics skills in this period (Figure 13).

³⁸ Mullis, Ina V.S., Michael O. Martin, Pierre Foy. 2005. IEA's TIMSS 2003 International Report on Achievement in the Mathematics Cognitive Domains, International Association for the Evaluation of Educational Achievement, Boston College.

Figure 13 Trend in Reading and Mathematics Test Scores in PISA International Standardized Test



Source: Based on data from the OECD 2003.

Low quality of schooling raises questions as to the adequacy of the secondary school system in delivering returns and improving employability and income prospects. Lack of quality education is an issue especially for poor rural migrants to urban areas. While there is a trade-off in terms of allocating resources to improving enrollment rates in education, investments in teaching quality are necessary in tandem in order to increase returns to education. Indonesia's performance in this international rating reinforces the fact that the education system is not relevant to the needs of the country's development and returns to investment in the sector are not maximized.

Annexes

ANNEX 1. ESTIMATING EDUCATION EXPENDITURES

The estimation reported in this report is based on a panel data of 46 developing and developed countries from 1972 to 2000. Budget data are drawn from the International Monetary Fund's Government Financial Statistics. The source of other control variables is the World Bank's World Development Indicators. Unobserved country characteristics were not controlled for, because the objective of the exercise was to compute the expected value of education spending given a set of economic demographic and geographical characteristics but purposely excluding unobserved historical patterns of spending (else the fitted values would only be useful to forecast the currently observed levels). Controlling for unobserved country specifics would generate expectations given the historical (and other unobserved relevant dimensions) and country-specific levels of education spending. A fixed-effects specification that controls for a country's specific unobserved characteristics generates even lower predictions (with an expected education spending share of approximately 12 percent of the consolidated budget).

The specification used can be written as:

$$\begin{aligned} Comp_{i,t} &= G(\alpha_0 + \alpha_1 Dec_{i,t} + \alpha_2 X_{i,t} + \alpha_3 dev_i + \alpha_4 Region_i + u_{i,t}) \\ \widehat{Comp}_{i,t} &= G(\alpha_0 + \alpha_1 Dec_{i,t} + \alpha_2 X_{i,t} + \alpha_3 dev_i + \alpha_4 Region_i) \end{aligned}$$

Where:

$G(\cdot)$: Denotes the logistic transformation applied to the model due to the fractional nature of the dependent variable ($G(x) = \log(x/1-x)$).

$Comp$: is the ratio of education expenditures to the total amount of public expenditures.

X : is a set of control variables, which include population, population density, GDP per capita, a measure of fiscal decentralization (sub-national expenditure share), and budget balance.

Dev : denotes a slope dummy defined as $(DEC * Industrial Dummy)$. This is introduced in the model to account for possible different impact of decentralization depending on the level of economic development.

$Region$: Regional dummies (LAC, MENA, NA, EASA, Sub-Saharan, relative to ECA)

Annex 2. COMPUTING SOCIAL RATES OF RETURN TO INVESTMENTS IN EDUCATION

Table A2.1. Mean Annual Earnings at Different Age Groups (in thousands Rupiah)

| Level of Education | Age Groups | | | | | | |
|----------------------------|------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | <14 (1) | 15-20 (2) | 21-30 (3) | 31-40 (4) | 41-50 (5) | 51-60 (6) | 61-70 (7) |
| No school | 2,665 | 4,328 | 4,655 | 4,983 | 4,892 | 4,406 | 3,545 |
| Primary | 4,211 | 4,790 | 5,978 | 6,750 | 7,182 | 7,955 | 5,985 |
| Junior High School General | 4,346 | 5,474 | 7,292 | 8,387 | 10,216 | 10,562 | 8,068 |
| Senior High School General | --- | 7,408 | 8,374 | 12,088 | 16,193 | 18,983 | 12,114 |

Source: National Labor Survey (Sakernas) 2006.

Data on wages per level of education and age group was computed based on the National Labor Survey (Sakernas) released in February 2006. These data covers 178,228 individuals who received salaries and wages in monetary terms or in kind. The net wage differentials for each age group is defined as the difference between average wages at each level of education and the average wages at a lower level of education. That is, for example, that the net differential for primary education, equals the difference between the average wage level of a person with primary education and that of a person with no education (or Rp. 4,211 – Rp. 2,665 = Rp. 1,546). The summation of net wage differentials over an expected time of work of 50 years into the future (from years 15 to 65) constitutes the social benefits in the cost benefit analysis of the returns to education.³⁹ Foregone wage and salary earnings are equal to 75 percent of the average earnings of individuals at a lower level education. The 75 percent is used to adjust for the percent of time that children attend school each year (technically student could work full time for the remaining 25 percent of the year).

Table A2.2. Investment Costs: Direct and Indirect Costs of Education

| | Foregone Earnings (1) | Direct Costs (2) | Annual Total Costs (3) | Total Costs Over Full Period (4) |
|----------------------------|-----------------------------|---------------------|---------------------------|--|
| No school | -- | -- | -- | -- |
| Primary | 3,246 | 2,880 | 6,126 | 36,754 |
| Junior High School General | 3,593 | 4,301 | 7,894 | 22,682 |
| Senior High School General | 4,106 | 5,143 | 9,250 | 27,749 |

Source: World Bank staff estimates

The direct costs of providing education at each level is the aggregate of the unit costs incurred at the school level and at each level of government in all administrative functions entailed in the provision of that level of education. The units costs used in this computation are reported in Table A2.3. These figures were drawn from a survey study of 2016 schools covering Primary Schools, Madrasah Ibtidaiyah (Moslem Primary Schools), Junior High School, Madrasah Tsanawiyah (Moslem Junior High School, Senior High School, Madrasah Aliyah (Moslem Senior High School and SMK (Technical Senior High Schools) within 56 districts and 15 province in Indonesia.⁴⁰ The unit cost at the school level covers costs such as teacher's salary; purchasing of classroom materials; school building development for classrooms as well as costs incurred to fund activities not directly related to the learning process but support this operation of the school, such as: principal and administration staff's salary; purchasing of schools equipment and peripheral for the principal and administration staff; and development and maintenance of buildings for the principal and administration staff.

³⁹ This is an admittedly narrow definition of benefits. Other methodologies entail broader definitions of benefits by including non-market benefits of education; such as benefits to civic institutions, to private and public health, and to fertility rates and /or the feedback of indirect earnings in the economy; for example, as firms are attracted to community seeking skilled labor in good environment. effect on growth (for a further discussion of these type of estimations see McMahon and Appiah, 2001).

⁴⁰ This survey was conducted for the Ministry of Education, financed by UNESCO, and lead by Abbas Ghazali. See Ghazali (2005).

The per-pupil annual costs of providing education is equal to the sum of foregone earning costs (column 1 in Table A2.2) and direct costs (column 2 in Table A2.2). In order to find the complete investment costs of educating one individual, the total costs are multiplied by the number of years required to complete each level of education; namely: primary education (6 years), junior secondary (3 years), and senior secondary (3 years).

Table A2.3. Unit Costs of Education by Education Level and Spending Unit (in thousand Rupiah)

| | Primary | Junior High | Senior High |
|--------------|----------------|--------------------|--------------------|
| School | 1,864 | 2,771 | 3,612 |
| Sub-district | 57 | 0 | 0 |
| District | 170 | 153 | 125 |
| Province | 159 | 141 | 117 |
| Central Gov. | 54 | 376 | 261 |
| Total | 2,304 | 3,441 | 4,115 |

Source: Ghozali (2005) Bab 5 Hasil dan Pembahasan, p. 83. Inflation rate 2005=10.5 percent 2006= 12.8 percent.

Limitations of this approach and future research on the topic

It is important to note that several other studies in education social rates of return report rates of return of significantly different magnitudes. A recent study UNESCO (2007), for example, reports returns for primary education in the range of 27 percent in rural areas, and 5 percent, in urban areas. Several studies report rates of return that include only the private market returns to education in the form of "increased earnings". These estimations involve the fitting of a semi-log ordinary least squares regression using the natural logarithm of earnings as the dependent variable, and years of schooling and potential years of labor market experience and its square as independent variables. Authors often label these coefficients "returns to education," whereas these are "marginal wage effects", not rates of return to investment in education. "The "returns" notion necessitates taking into account the cost of education, both private and public, and relating this cost to the wage effect (Psacharopoulos 1994, p. 1326).

The figures reported in this estimation do not include non-market benefits (effects on health, life expectancy, population growth, etc) or externality feedback effects (the additional economic benefits from the initial education outcomes, such as the effects of education on the economy through democratization, political stability, etc.). Both of these are without doubt part of the social benefits. As pointed out by Mc Mahon (2006) "the value of additional non-market benefits is estimated by Wolfe and Zuvekas (1997) to be about equal in value to the market returns based on the cost of producing the same outcomes by alternative means." This means that the rates of return estimated in this report could be considerably lower than the true total returns to economic development from investment in education. An additional point to note is that, the National Labor Survey reports earnings of organized labor markets. Some studies reveal the need to use real output (bushels of rice produced) to measure real income of farmers, as opposed to urban wages. Jamison, for example, concludes that farm productivity increases in average by 7.4 percent as a result of a farmer completing elementary education which could considerably increase the rates of return.

Taking some of the considerations discussed above into account would scale up the education rates of return reported by a percentage dependant on the numbers of effects incorporated, the methodology employed, and the assumptions made. The estimations presented herein result from a methodology that includes private and public costs of education, following the "elaborated" methodology described in Psacharopoulos (1994), and employed by McMahan and Boediono (1992). The team that conducted this report did not extend the scope of the basic methodology, but have marked such type of exercises as part of an agenda for future research.

ANNEX 3. DETERMINANTS OF NET ENROLLMENT RATE IN INDONESIA

The following specification is aimed to examine demand and supply side factors in the determination of education outcomes.

$$R_i = \alpha + \beta_1 E_1 + \beta_2 E_2 + \beta_3 S + \beta_4 GRDP + \beta_5 Po + \beta_6 R + \beta_7 A + \beta_8 Sc + \beta_9 D + \beta_{10} K + \beta_{11} L + u_i$$

Where:

i = District i = 1...N, N=409

R = Net enrollment rates

E1 = Log of education spending per population in school age (total education spending per number of children aged between 7 and 18 years).⁴¹

E2 = Log average district education spending (per population in school age) from 2001 to 2003

S = Education personnel spending as share of total education spending (ratio of personnel spending to total education spending)

GRDP = Log of Gross Regional Product per capita

Po = Poverty head count

R = Remote area (Geometric average of the distance from village to the closer adjacent district)

A = Road Access (% of villages with access to paved roads)

Sc = No of primary and secondary schools per square kilometer

D = Disaster (0-1) variable indicating whether the district has been hit by any kind of disaster during last year

K = Dummy for urban/rural districts (=1 for urban)

L = Percent of population in school age working

Sources

Net enrollment and percent of population in school age that work were computed based on the National Socio- Economic Survey (Susenas) 2005. Education spending and the share of salaries in total education spending are taken from the SIKD (sub-national budgets) dataset, and from the distribution of central government spending on DAK and Dekonsentrasi as reported by the MoF. Gross domestic product per district is drawn from figures released by the National Statistics Bureau (BPS). The remaining variables are computed based in Podes 2005.

Econometric Models

Models 1, 2 and 3 estimate the specification linearly by ordinary least squares; whereas model 4 estimates a Logit model. The latter due to the fractional nature of the dependent variable. Model 3 and 4 control for province-level unobserved effects by including province dummies (fixed-effects). The province level coefficients are not reported for exposition simplicity.

Regression results confirm the role of public spending as a determinant of enrollment rates. The coefficient for public education spending is positive and statistically significant in all of the estimated models and specifications. Given the linear-log functional form used in the estimation, a one percent increase in education spending would increase the net enrollment rate by 0.02 percentage points, with a point elasticity of $0.02 * (1/\text{Net enrollment of district } i)$. The elasticity of education expenditures resulting from the Logit model (column 4) is on the same range as the linear models (approximately .03). There are lags built into all models with spending in education (per potential student) preceding the impact on enrollment by 1 year and the average of district spending by lag from 2 to 4 years (2001-2003). Yet, the average district spending (per population in school age) from 2001-2003 is not statistically significant in any of the estimated models.

⁴¹ Population in school age is used to proxy for per capita spending (as opposed to the number of actual students) in order to avoid endogeneity (i.e. an increase in net enrollment, reflecting a higher number of actual students, would also increase the denominator of a spending “per student” variable).

The results do not provide evidence of the existence of differences between districts in remote and non-remote areas, but does provide evidence of differences between urban and rural districts. Models 1 and 2 differ only on that model one includes a dummy variable to control for differences between urban and rural districts. This variable is statistically significant in model 1 and has the expected sign (positive). Yet when the variables labor and number of schools are included, the sign of the urban dummy turns negative and non-statistically significant. This is likely because the underlying reasons for an expected difference between rural and urban districts are precisely driven by a expectedly larger number of schools and lower incidence of student labor in urban districts. When the number of schools and labor are controlled for independently, in addition to the urban dummy, the urban dummy becomes negative perhaps capturing some type of spurious effect. Hence model 2 replaces the urban dummy variable for the variables labor and number of schools per square kilometer variables and results in a higher adjusted r-square. The variable remote is not statistically significant in any of the specifications.

Estimation of the Determinants of Education Net Enrollment

Dependent Variable: Net Enrollment Rates

| Variable | OLS (1) | OLS (2) | Fixed effects (3) | Logit-fixed effects (4) |
|--|------------------------|-----------------------|----------------------|-----------------------------------|
| Log education spending (per population in school age) | 0.02** (2.67) | 0.02** (2.61) | 0.02** (3.11) | 0.14** [.028] (4.03) |
| Log average district education spending (per population in school age) from 2001 to 2003 | 6.9 e-3 (0.8) | 0.01 (1.32) | 3.2 e-3 (0.43) | 0.018 [0.003] (0.43) |
| Log gross regional product | 1.1 e-2** (2.86) | 7.3 e-3* (1.76) | 2.4 e-3 (.64) | 0.02 [.003] (1.01) |
| Share of education personnel spending in total education spending | -0.015 (-.92) | -0.01 (-0.8) | -3.2 e-4 (-0.20) | -2.2 e-2 [-7.3 e-4] (-.03) |
| Poverty head count | -0.08 (-2.03) | -0.06* (-1.46) | -0.11* (-2.32) | -0.62* [-.11] (-2.39) |
| Remote area | -9.91 e-5 (-.71) | -2.3 e-5 (-.16) | -2.0 e-5 (-.14) | 1.8 e-4 [-3.34 e-5] (-0.26) |
| Road Access | 1.5 e-4** (2.75) | 1.3 e-4** (2.56) | 4.01 e-5 (0.8) | 2.0 e-4 [3.72 e-5] (.74) |
| Disaster | -3.02 e-4** (-3.65) | -3.0 e-4** (-3.68) | -1.1 e-4 (-1.55) | 5.9 e-4 [1.1 e-4] (-1.62) |
| Dummy for urban/rural districts | 0.02* (2.21) | | | |
| Labor | | -0.30** (-5.59) | -0.31** (-6.24) | -1.6** [-.30] (-4.79) |
| No. of primary and secondary schools per square kilometer | | 4.5 e-3 (1.72) | 1.9 e-3 (.76) | 1.7 e-2 [3.1 e-2] (1.22) |
| Constant | 0.04 (.27) | 0.15 (1.0) | 0.30 (1.97) | -0.73 (-0.92) |
| Adjusted R-square | .29 | .36 | .56 | --- |
| No. Obs. | 303 | 299 | 299 | 299 |

Source: World Bank staff estimates.

Note: t-statistics reported in parentheses **, *, + denote significance at the 1 percent, 5 percent and 10 percent level, respectively. Column 4 reports the elasticity at mean values of the explanatory variables in brackets.

Gross regional product, road access, and natural disaster variables are significant in the first and second models but turn not significant when the unobserved characteristics at the province level are controlled for. This may reflect the fact that these characteristics are commonly shared by all districts in determined provinces and thus captured by the province dummies.

Demand side factors such as poverty and the percent of population in school age that works, have an impact in net enrollment. The coefficients for poverty head count and student labor are negative and statistically significant in all models and specifications, reflecting the importance of the demand side factors in determining education outcomes. Attaining a higher level of education is costly not only to the school but also to households, and so, socio-economic characteristics of the population are important determinants of enrollment. Households in poor districts may not enroll their children, even when they have access to schools, and so it is important to implement policies aimed not only to reduce fees but to reduce poverty. Lower income families require support mechanisms that enable them to afford having their children attending school, such as compensation for foregone earnings (loss in monetary contributions) or household labor.

The new 2005 Teacher Law states that teachers will receive functional, special area, and professional incentives. Figure 11 estimates the impact of these incentives on the education budget. Calculations in this figure are based on the following assumptions:

- The special area allowance will be equal to the teacher's base salary (2005 Teacher Law). It is assumed that the average salary is 18 million Rp per year and that, for the first two years, 5 percent of teachers will receive this allowance. Ten percent of teachers will receive the incentive by 2009, and this percentage will remain through 2016. The reason for a staggered increase is that the government most likely will phase in the designation of special area schools.
- The professional allowance will be given to teachers who pass a certification examination and will be equal to the teacher's base salary (2005 Teacher Law). The calculation of the professional allowance is complex and requires many assumptions (including the number of teachers who will pass the certification examination, the average base salary of teachers who receive certification, and the rate of increase of teachers in the workforce). The estimate of teachers receiving the incentive for the first three years is based on MoNE targets: 5 percent of teachers will receive the allowance in 2007, 12 percent in 2008, and 20 percent in 2009. The incentive then is assumed to increase by 10 percent through 2016, so that by then 90 percent of teachers will receive the incentive. This target is optimistic. A more conservative estimate is 70 percent, which would reduce the overall expenditure on the professional incentive.
- The functional incentive was specified in an October 2006 version of the draft regulations was to be 50 percent of base salary and to be given to certified teachers. This has since been changed in a November 2006 version of the draft to not specify an amount, but to still be given to teachers who are certified. Still, there is debate on whether it should be given to all teachers or possibly be used as additional performance incentives for teachers. If the incentive is given to all teachers, it will have a significant immediate impact on the budget. If it is given to only certified teachers and only to those that meet certain performance requirements, then it will have a gradual effect (because no teachers are certified yet), but it will be much larger in the long-term.
- The number of teachers is estimated to stay constant. Although Indonesia's teaching workforce has increased steadily in the past, there is now a large oversupply of teachers. The new incentives will push MoNE to be more efficient in its supply and distribution of teachers. The 2006 teacher regulations (RPP Guru) demonstrate that MoNE is serious about attempting to control the supply of teachers. There is also a slight bulge of teachers aged 50–60. The retirement of these teachers will help by not keeping the number of teachers constant or reducing the workforce. If the steady trend of increasing the number of teachers continues, it will increase the expenditure that goes toward teacher salaries and incentives.
- The forecast calculations are in real (rather than nominal) terms. Salaries and incentives are assumed to increase with the rate of inflation.

ANNEX 5 ESTIMATING THE FINANCIAL IMPLICATIONS OF TEACHER OVERSUPPLY

The teacher oversupply issue in Indonesia presents several forms of inefficiency, one of them being the oversupply of teachers. Addressing the supply issue could result on significant potential savings. The table below shows an estimate of the potential savings. The calculations are based on the following method and assumptions:

- Only public school teachers are included, since this is the area government is financing and has control over. Student data used in the calculations is also only for public schools.
- Because 22 percent of public junior secondary teachers and 25 percent of public senior secondary teachers are part-time, an adjustment is made so that two part-time teachers is equivalent to be one full-time teacher. (The number of part-time teachers in private schools is much higher, at 55 percent and 63 percent for junior and senior respectively).
- It is assumed that the average teacher salary is 17 million per year for primary teachers and 18 million for junior and senior secondary teachers.
- The proposed policy was applied on a school-by-school basis on a survey sample so that a realistic estimate of the number of required teachers and level of teacher oversupply by school is determined. The resulting figures were then applied nationally, with weighting applied to schools by size.
- The effective STR is used in the calculations. There is a difference between proposed STR and effective STR. For example, the primary STR used is 30:1, but when applying the formula of each school getting at least 4 teachers for each school and a target STR of 30:1, the effective STR is actually 26:1. This is because (1) a school with, say, 40 students, will still get 4 teachers and have an STR of 10:1 and (2) the additional teacher allocation is rounded up, so a school with, say, 160 students will get 6 teachers, for an STR of 27:1.

The allocation formula for Junior Secondary and Senior Secondary teachers is complex because it currently requires that teachers be assigned to classes for specific subjects. For the purposes of analysis, an STR is applied with what would be more in line with other countries than Indonesia's currently low STRs of 14:1 for Junior Secondary and 12:1 for Senior Secondary.

In the following table, column A reports the actual supply of teachers whereas column B shows what the STR could be if the proposed new entitlement formula is used instead. In the latter scenario, 22.8 percent fewer teachers are required (or 19.4 percent taking part-time into account). This would amount to a salary savings of approximately 6.7 trillion Rupiah. Taking part-time teachers into account (assuming 2 part-time = 1 full-time), the amount is reduced to 5.6 trillion Rupiah, which is still approximately 10 percent of the total education budget. This represents significant potential savings and would become even more significant with the impact of the new teacher law, where teachers who become certified will receive an allowance equivalent to their base salary (see the Teacher Salaries, Incentives, and Education Quality section four).

Comparative Costs Based on Current Situation and Proposed Option

| | A: STR – Actual | B: STR – Proposed |
|---|-----------------|------------------------------|
| Primary STR | 20:1 | 30:1 (effective 26:1) |
| Teachers required | 1,177,929 | 937,332 |
| Total Salary cost (in thousand Rupiah) | 20,024,793 | 15,934,644 |
| Positions saved (B to A) | | 240,597 |
| Junior Secondary STR | 14:1 | 24:1 (effective 22:1) |
| Teachers required | 364,098 | 274,354 |
| Salary cost (in thousand Rupiah) | 6,553,764 | 4,938,372 |
| Positions saved (B to A) | | 89,744 |
| Taking part-time into account (B to A) | | 49,693 |
| Senior Secondary STR | 12:1 | 24:1 (effective 22:1) |
| Teachers required | 144,604 | 90,088 |
| Salary cost (in thousand Rupiah) | 2,602,872 | 1,621,584 |
| Positions saved (B to A) | | 54,516 |
| Taking part-time into account (B to A) | | 36,441 |
| Total | | |
| Total Teachers | 1,686,631 | 1,301,774 |
| Total salary cost (in thousand Rupiah) | 29,181,429 | 22,494,600 |
| Total positions saved (B to A) | | 330,340 |
| Salary savings (Rp.'000,000) (B to A) | | 6,686,829 |
| Total positions saved with part-time taken into account (B to A) | | 326,731 |
| Salary savings with part-time taken into account (Rp.'000,000) (B to A) | | 5,640,556 |

Source: Teacher Employment and Deployment Study 2005, based on MoNE 2003/2004 data on teachers, salary.

ANNEX 6 CHARACTERISTICS OF EDUCATION PERSONNEL IN INDONESIA

Number and Percent of Part-Time and Full-Time Teachers in Secondary Education

| | Headmasters | % | Full-time Teachers | % | Part-time Teachers | % | Total |
|-------------------------|---------------|----------|--------------------|-----------|--------------------|-----------|----------------|
| Junior Secondary | 22,240 | 4 | 343,575 | 63 | 176,776 | 33 | 542,591 |
| Public | 12,037 | 3 | 274,668 | 75 | 78,925 | 22 | 365,630 |
| Private | 10,203 | 6 | 68,907 | 39 | 97,851 | 55 | 176,961 |
| Senior Secondary | 14,366 | 3 | 220,133 | 51 | 200,967 | 46 | 435,466 |
| Public | 4,673 | 2 | 140,582 | 73 | 47,269 | 25 | 192,524 |
| Private | 9,693 | 4 | 79,551 | 33 | 153,698 | 63 | 242,942 |

Source: MoNE 2005.

Number and Percent of Primary Teachers Per Responsibility

| | Teacher Responsibility | | | | |
|--------------------|------------------------|----------------|-------------------|----------------|------------------|
| Primary level | Headmasters | Class teachers | Religion teachers | Sport teachers | Total |
| Number of teachers | 146,045 | 934,479 | 167,449 | 87,113 | 1,335,086 |
| Percent of total | 11% | 70% | 13% | 7% | 100% |

Source: MoNE 2005.

ANNEX 7 TEACHER EARNINGS IN INDONESIA: ECONOMETRIC ANALYSIS

Average Monthly Earnings and Hours Worked by Teachers and Non-Teachers by Level of Education

| Teacher's Level of Education | Average monthly earnings (000 Rupiah) | | | | Average hours worked per week | | | |
|------------------------------|---------------------------------------|---------------------|------------------------|--------------------|-------------------------------|---------------------|------------------------|--------------------|
| | Not teacher | Teacher not primary | Primary school teacher | Total Paid Workers | Not teacher | Teacher not primary | Primary school teacher | Total Paid workers |
| Less than primary | 445.5 (294.4) | | | 445.5 (294) | 46 (16) | | | 46 (16) |
| Primary | 528.4 (381) | | | 528.4 (381) | 48 (14) | | | 48 (14) |
| Junior secondary | 643.4 (401) | | | 643.4 (401.1) | 48 (12) | | | 48 (12) |
| Senior secondary | 920.0 (671) | 621.6 (519) | 1,062.7 (778) | 917.4 (675.3) | 46 (10) | 30 (12) | 34 (8.5) | 45 (11) |
| Diploma I and II | 1,147.7 (1,250) | 1,070.1 (1,206) | 1,220.4 (410) | 1,168 (933.9) | 43 (12) | 32 (9) | 34 (7) | 36 (10) |
| Academy/Dipl III | 1,441.7 (1,131) | 1,298.1 (1,867) | 1,143.4 (434) | 1,392.2 (1,227) | 44 (9) | 35 (10) | 36 (7) | 42 (10) |
| University/ Dipl IV | 1,772.1 (1,856) | 1,1432.7 (645.2) | 1,160.1 (502) | 1,536 (1,540.9) | 43 (9) | 34 (10) | 34 (8) | 39 (11) |
| Total | 816.5 (796.7) | 1,033.2 (953.8) | 1,139.3 (605) | 841.9 (801) | 47 (12) | 33 (11) | 34 (8) | 46 (13) |
| Observations | 35,252 | 1,804 | 1,615 | 38,671 | 35,252 | 1,804 | 1,615 | 38,671 |

Source: World Bank staff calculations based on data from Sakernas 2004.

Note: Standard deviation in parentheses. Blank spaces indicate that there are no teachers with less than senior secondary education.

Difference in Earnings: Sample of Paid Workers with Secondary Schooling or More Education (%)

| | 2000 (Filmer 2002) Sample: All paid workers (public and private sectors) | | 2004 (World Bank 2006) Sample: Teachers and other civil servants (public sector) | | | |
|---|--|--------------------|--|----------------------|-------------------|-------------------|
| <i>Dependent variable log of monthly earnings wages</i> | | | | | | |
| Teacher | -0.18 (9.25)** | | -0.21 (-20.79)** | | -26.09 (-0.30) | |
| Teacher primary school | | -0.025 (1.14) | | -0.06 (9.09)** | | -17.96 (-4.29) |
| Teacher not primary school | | -0.34 (13.19)** | | -0.33 (-16.16)** | | -32.22 (-8.52) |
| Civil servants (excluding teachers) | | | 24.33 (5.89)** | | | |
| Age | .06 (15.49)** | 0.061 (15.47)** | 0.07 (33.24)** | 0.07 (32.73)** | 18.33 (23.43) | 17.25 (22.09) |
| Age square | -0.00 (7.98)** | -0.00 (8.11)** | -0.00 (-21.04)** | -0.001 (-20.71)** | -0.16 (-18.14) | -0.15 (-17.40) |
| Male | 0.14 (12.32)** | 0.15 (13.03)** | 0.18 (21.84)** | 0.18 (22.37)** | 12.36 (5.41) | 12.73 (5.62) |
| Urban | 0.12 (7.10)** | 0.14 (7.88)** | 0.14 (17.55)** | 0.15 (18.51)** | 4.71 (2.12) | 6.74 (3.02) |
| Educ. Diploma I & II | 0.32 (15.26)** | 0.27 (12.86)** | 0.49 (22.51)** | 0.42 (19.74)** | 29.27 (8.8) | 27.48 (8.39) |
| Educ. Academy Diploma III | 0.33 (15.92)** | 0.36 (16.96)** | 0.59 (30.81)** | 0.61 (31.64)** | 30.91 (7.04) | 36.67 (8.16) |
| Educ. University Diploma IV | 0.37 (18.71)** | 0.42 (20.58)** | 0.65 (46.93)** | 0.70 (49.43)** | 32.52 (11.06) | 41.27 (13.09) |
| Constant | 11.67 (164.24) | 11.67 (165.46) | 11.76 (344.00)** | 11.78 (346.11)** | 9.67 (63.37) | 9.83 (64.47) |
| Observations | 18,612 | 18,612 | 30,130 | 30,130 | 3,655 | 3,655 |
| R squared | 0.30 | 0.31 | .27 | .28 | .37 | .39 |

Source: World Bank staff estimates.

Note: Robust t-statistics reported in parentheses. ** denotes significance at the 1 percent level. Earnings are defined as wage salary in cash plus wage salary in kind.

Determinants of teacher hourly earnings

| Dependent variable log of hourly earnings | | | | | |
|---|--|---------------------|---------------------|--|---------------------|
| | Sample: All paid workers (public and private sectors) | | | Sample: Teachers and other civil servants (public sector) | |
| Teacher | 23.42 (16.66)** | | | -18.70 (-4.64)** | |
| Teacher primary school | | 46.94 (23.13)** | | | -12.58 (-2.91)** |
| Teacher not primary school | | 4.98 (3.01)** | | | -23.47 (-5.86)** |
| Civil servants (excluding teachers) | | | 46.72 (9.34)** | | |
| Age | 7.43 (44.43)** | 7.33 (43.95)** | 7.59 (45.31)** | 14.26 (18.6)** | 13.53 (17.58)** |
| Age square | -0.08 (-36.05)** | -0.08 (-35.7)** | -0.08 (-36.58)** | -0.12 (-13.91)** | -0.11 (-13.07)** |
| Male | 34.18 (41.84)** | 34.40 (42.2)** | 31.82 (39.57)** | 6.52 (2.94)** | 6.76 (3.06)** |
| Urban | 20.46 (27.27)** | 20.91 (27.89)** | 18.99 (25.56)** | 3.02 (1.38) | 4.39 (1.98) |
| Educ. Diploma I and II | 80.73 (30.01)** | 71.92 (27.23)** | 104.22 (39.08)** | 29.27 (8.82)** | 28.02 (8.51)** |
| Educ. Academy/Diploma III | 93.56 (39.04)** | 95.36 (40.06)** | 101.04 (42.02)** | 23.90 (5.6)** | 27.65 (6.35)** |
| Educ. University/Diploma IV | 101.09 (59.18)** | 107.40 (61.19)** | 113.19 (68.03)** | 31.30 (10.7)** | 37.26 (11.95)** |
| Constant | 6.30 (221.31)** | 0.03 (222.45)** | 6.30 (220.57)** | 5.52 (36.26)** | 5.63 (36.84)** |
| Observations | 38,431 | 38,431 | 38,431 | 3,616 | 3,616 |
| R squared | .31 | .32 | .32 | .30 | .31 |

Source: World Bank staff estimates.

Note: Robust t-statistics reported in parentheses. ** denotes significance at the 1 percent level. Earnings are defined as wage salary in cash plus wage salary in kind.

Hourly earnings are calculated on the basis of average monthly earnings, divided by hours reported in the main job in the past week x 4

Differences in Monthly Earnings: After Controlling for Individual Characteristics (Relative to West Java)
(Percentages)

| Province | Teachers | Other paid workers | Difference |
|---------------------|----------|--------------------|------------|
| DI Aceh | 3.3 | -8.3** | -11.6 |
| North Sumatra | 10.2+ | -7.0** | -17.2 |
| West Sumatra | 8.7 | -6.7** | -15.4 |
| Riau | 5.2 | 20.9** | 15.7 |
| Jambi | 4.2 | -8.6** | -12.8 |
| South Sumatra | 17.3* | -3.7** | -21.1 |
| Bengkulu | -1.6 | -23.3** | -21.7 |
| Lampung | -2.8 | -17.6** | -14.8 |
| Bangka Belitung | -13.8 | -0.2** | 13.6 |
| DKI Jakarta | 11.9+ | 21.6** | 9.6 |
| Central Java | -14.7** | -22.8** | -8.1 |
| DI Yogyakarta | -4.0 | -29.1** | -25.0 |
| East Java | -23.0** | -16.5 | 6.5 |
| Banten | -10.9+ | 16.0** | 26.8 |
| Bali | 2.3 | -6.3** | -8.6 |
| Nusa Tenggara Barat | -14.1* | -29.8 | -15.7 |
| Nusa Tenggara Timur | 13.3+ | -20.3** | -33.6 |
| West Kalimantan | 25.0 | 17.3** | -17.2 |
| Central Kalimantan | -9.4 | 1.5** | -7.7 |
| South Kalimantan | 16.1+ | 23.5** | 10.9 |
| East Kalimantan | 30.0** | 4.5** | 7.4 |
| North Sulawesi | 8.0 | -9.6** | -25.6 |
| Central Sulawesi | -5.7 | -5.7** | -17.6 |
| South Sulawesi | -0.8 | -13.4 | 0.0 |
| Southeast Sulawesi | 7.8 | -22.4** | -12.7 |
| Gorontalo | 34.6** | -0.3 | -30.2 |
| North Maluku | 21.3 | 22.7** | -35.0 |
| Papua | 88.1** | 53.2 | 1.4 |

Source: Analysis of Sakernas 2004.

Note: Conditional differentials are derived from the coefficients on the dummy variables for provinces in the multivariate regression of earnings (that is, $100 \cdot (\exp(b) - 1)$), where b is the province-specific dummy coefficient estimate. Sample of workers with secondary schooling or more. +, *, ** denote significance at the 10 percent, 5 percent and 1 percent levels.

ANNEX 8 INTERPRETATIONS OF THE 20 PERCENT “RULE”

Alternative Interpretations of How to Compute the Education Spending Ratio

| | | | | |
|---|------------|--|------------|-------------|
| Central government spending on education programs <i>including salaries</i> | (1) | Total central government spending <i>(excluding transfers to regions)</i> | (1) | 9.4 |
| Central government spending on education programs <i>excluding salaries</i> | (2) | Total central government spending (excluding transfers to regions) | (1) | 7.4 |
| Central government spending on education programs excluding salaries | (2) | Total central government spending <i>(excluding transfers to regions and salaries of all other sectors)</i> | (2) | 10.1 |
| Central government spending on education programs including education related budget <i>from all line ministries and institutions* including salaries</i> | (3) | Total central government spending (excluding transfers to regions) | (1) | 11.8 |
| Central government spending on education programs including other education related budget for all line ministries and institutions <i>excluding salaries</i> | (4) | Total central government spending (excluding transfers to regions) | (1) | 9.6 |
| Central government spending on education programs including other education related budget for all line ministries and institutions excluding salaries | (4) | Total central government spending (excluding transfers to regions and salaries of all other sectors) | (2) | 11.75 |
| Central government spending on education programs including other education related budget for all line ministries <i>and an estimate of the amount of transfers to regions that is allocated to education</i> | (5) | Total central government spending <i>(including transfers to regions)</i> | (3) | 19.3 * |
| Central government spending on education programs including other education related budget for all line ministries and an estimate of the amount of transfers to regions that is allocated to education <i>excluding salaries</i> | (6) | Total central government spending (including transfers to regions) | (3) | 7.6 |
| Central government spending on education programs including other education related budget for all line ministries and an estimate of the amount of transfers to regions that is allocated to education excluding salaries | (6) | Total central government spending <i>(including transfers to regions, excluding salaries of all other sectors)</i> | (4) | 8.65 |
| Total spending in education from central government, provinces and districts (including salaries) | (7) | Total national spending: Central (APBN minus transfers) + Province (APBD I) + District (APBD II) | (5) | 16.5 |

Source: Computed by World Bank staff based on MoF and SIKD data.

Note: Numbers in parentheses denote all the different figures in denominator and numerator. Changes in the definition relative to a previously used definition are highlighted and in italics. *For example, other education-related expenditures by line ministries are capacity development efforts for civil society to join the military and police academy, training for heads of sub-district

* This estimation was presented on the Constitutional Court on February 7 2006, by MoF and MoNE. It includes education and training allowances for 16 ministries beside MoNE, as well as an estimation of the education expenditures by sub-national governments from the (DAU) and (DAK)

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